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THE

ENTOMOLOGIST

AN

ILLUSTRATED JOURNAL

OF

GENERAL ENTOMOLOGY.

EDITED BY JOHN T. CARRINGTON, F.L.S.

WITH THE ASSISTANCE OF

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> " By mutual confidence and mutual aid
> Great deeds are done and great discoveries made."
> POPE'S '*Homer.*'

VOLUME THE FIFTEENTH.

LONDON:
SIMPKIN, MARSHALL, & CO., STATIONERS' HALL COURT.

1882.

131742

"When simple curiosity passes into the love of knowledge as such, and the gratification of the æsthetic sense of the beauty of completeness and accuracy seems more desirable than the easy indolence of ignorance; when the finding out of the causes of things becomes a source of joy, and he is counted happy who is successful in the search; common knowledge of Nature passes into what our forefathers called Natural History, from whence there is but a step to that which used to be termed Natural Philosophy, and now passes by the name of Physical Science."

THOMAS HENRY HUXLEY, *in* "*The Crayfish.*"

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THE ENTOMOLOGIST.

Vol. XV.] JANUARY, 1882. [No. 224.

NOTES ON THE LEPIDOPTERA OF THE ORKNEY ISLANDS.

By J. Jenner Weir, F.L.S., F.Z.S.

The Orkney Islands lie between 58° 41′ and 59° 23′ N. lat., and between about 2° and 3° W. long., thus being from 7° to 8° north of London; still the climate is mild. The average temperature of February, the coldest month, is 38°, and of July, the hottest month, 55° 14′. The rain-fall during the year averages about 36¾ inches. These islands are separated from the north-east of Scotland by the Pentland Firth, which, at the narrowest part, is not more than 5½ miles in width. The whole group, with the exception of a small granitic district, near Stromness, consists of rocks belonging to the old red sandstone formation; thus their geological structure differs essentially from that of either the Shetlands or Outer Hebrides.

Through the kindness of Mr. Meek I have been enabled to examine a collection of Lepidoptera made in the Islands during four months of the past season, which are in the possession of Mr. Clarence E. Fry, through whose instrumentality they were collected. As might be expected, from the near proximity of the Islands to the North of Scotland, the insects do not in most cases differ materially from those found on the mainland; yet the collection is most interesting, presenting in many of the species differences in colour from that which obtains either in the Shetlands or Outer Hebrides.

The following is a list of the Lepidoptera taken in the Island of Hoy, about eight miles distant from the coast of Caithness, and in which island alone were any insects collected:—

*Pieris brassicæ
*Chortobius Davus
*Lycæna Icarus
Acherontia Atropos

Hepialus lupulinus
*_H. humuli_
*_Chelonia plantaginis_
Scodiona belgiaria
Fidonia atomaria
Oporabia filigrammaria
*_Larentia didymata_
L. cæsiata
L. salicata
L. pectinitaria
*_Emmelesia albulata_
E. ericetata
E. blandiata
*_Eupithecia venosata_
E. satyrata
E. nanata
E. sobrinata
E. pumilata
Thera simulata
Ypsipetes ruberata
*_Y. elutata_
Melanthia ocellata
M. sociata
*_M. montanata_
Coremia munitata
Cidaria miata
*_C. russata_
*_C. immanata_
*_C. testata_
C. populata
C. fulvata
Carsia imbutata
Anaitis plagiata
Hydrœcia nictitans
H. micacea
Xylophasia rurea and var. _combusta_
X. polyodon
Mamestra furva
Apamea basilinea
A. gemina
A. oculea
Miana furuncula
Celæna Haworthii
Caradrina cubicularis
Agrotis suffusa
A. porphyrea
A. pyrophila (melanic var.)
*_Triphæna orbona_
T. pronuba
Noctua glareosa
N. augur
N. C-nigrum
*_N. festiva_ and var. _conflua_
*_N. Dahlii_
*_N. rubi_
N. neglecta
*_N. xanthographa_
Tæniocampa gothica
Xanthia ferruginea
*_Epunda lutulenta_ (var. _Luneburgensis_)
E. viminalis
Euplexia occulta
Hadena adusta
H. glauca
H. dentina
H. thalassina
Calocampa vetusta
C. exoleta
Plusia gamma
Stilbia anomala
Herbula cespitalis
Scopula lutealis
S. prunalis
Stenopteryx hybridalis
Scoparia atomalis
S. alpina
Crambus pratellus
C. culmellus
Peronea Caledoniana
P. variegana
P. Hastiana
Teras caudana
T. contaminana
Dictyopteryx Læflingiana

Penthina marginana
Sericoris littoralis
Mixodia Schulziana
Cnephasia musculana
Clepsis rusticana
Bactra lanceolana
Phoxopteryx unguicana
P. myrtillana
Grapholita campopoliliana
G. Penkleriana
Phæodes tetraquetrana
Hypermecia cruciana
Pædisca Solandriana
P. sordidana.
Ephippiphora Pflugiana
Pamplusia mercuriana
Catoptria ulicetana
Xylopoda Fabriciana
Eupœcilia angustana
E. ciliella
Argyrolepia Baumanniana
A. cnicana
Aphelia osseana

In this list none but those marked with an asterisk call for any remark; the coloration of the others is similar to that of the ordinary Scottish type.

Pieris brassicæ.—It is doubtful whether this species is indigenous; it has probably been introduced with the cultivated *Brassicaceæ.*

Chortobius Davus.—The Orcadian specimens resemble in colour those from Rannoch.

Lycæna Icarus.—The specimens are large, measuring as much as 1 inch 5 lines; an unexpected fact.

Hepialus humuli.—It is noteworthy that none of the specimens taken approach in the slightest degree the coloration of the variety *Hethlandica,* but all are quite of the ordinary normal type.

Chelonia plantaginis.—Here, as in the Shetland examples of this species, the colour of the upper wing is of a very light straw-colour in some specimens.

Larentia didymata.—The females of those taken are of an unusually light colour.

Emmelesia albulata.—This insect which, both in the Shetlands and Hebrides, varies so much from the normal type that I have deemed those from each group of islands worthy of a subspecific name, appears in the Orkneys of the usual colour.

Eupithecia venosata.—The leaden grey ground colour of this insect, as found in Shetland, does not appear to extend to those taken in the Orkneys.

Ypsipetes elutata.—The specimens are very variable; some extreme aberrations have the ground colour of the wings black, with very decided red bars.

Melanippe montanata.—Those taken are of the normal colour, except one very light variety; but none approach the variety *Shetlandica.*

Cidaria russata.—This variable insect, which is so uniform in colour in the Hebrides, is in the Orkneys very variable; two specimens present the extreme aberration of a yellow ground colour to the upper wings, with black lines.

Cidaria immanata.—The Orcadian closely approach in colour to the Shetlandic.

It may be here remarked that in the Shetlands it appears *C. immanata* is found, and not the closely-allied *C. russata;* in the Hebrides the reverse is the case, but in the Orkneys both species are found; indeed all the evidence shows that the latter islands are barely insular in their Lepidoptera.

Cidaria testata.—The specimens are of a dark purplish lead-colour in their markings, and, like those from Shetland, are devoid of yellow. I believe that this dark form of the insect may be often found farther south, as I find one in my collection labelled as taken by myself in the New Forest.

Triphæna orbona.—Only one specimen taken, and that of the form known as *Curtisii.*

Noctua festiva, N. Dahlii, and *N. rubi.*—These three species, taken in the Orkneys, resemble each other very closely, and it requires a careful examination to separate them; the prevailing colour in each species is ruddy brown. The same remark applies, but in a less degree, to *N. xanthographa.*

Epunda lutulenta var. *Luneburgensis.*—This is a very interesting capture; several specimens taken agree well with the description given by Staudinger in his 'Catalogue of European Lepidoptera,' No. 1341, p. 95. He writes as follows:—"Nigricans, fasciis distinctis albis." The habitat given is South-western Germany; ? Pyrenees.

The subject of the entomological fauna of the more remote British Isles is a new field of investigation, and promises to yield good results to those who engage in it. At present we know, and probably only partially, the Lepidoptera found in one of the Shetlands, Mainland; one of the Orkneys, Hoy; one of the Outer Hebrides, Lewis; and very little of any other islands of the three groups.

There can be no doubt that the Færöe Isles, although politically belonging to Denmark, as the Shetlands and Orkneys did until after the middle of the 15th century, are geographically a portion of the British Islands. The Shetland Islands lie halfway between Norway and the Færöes, and I am quite of opinion that the Lepidoptera of the Færöes should appear in our cabinets in a collection strictly of the indigenous Lepidoptera of the British Isles, viewed geographically; precisely as, for the converse reason, I should exclude the insects of the Channel Islands and Heligoland, which geographically belong to France and Germany respectively, but politically to England.

To my mind the inclusion of the Shetlands and Orkneys in the British Isles for entomological purposes, simply because they were mortgaged in 1469 to James III. of Scotland by the king of Denmark and not redeemed, and the exclusion of the Færöe Isles only because they still remain a part of the dominion of the king of Denmark, is absurd. It would indeed be a novelty to deal with the geographical distribution of animals on a political basis.

6, Haddo Villas, Blackheath, London, S.E., November, 1881.

NOTES ON THE LEPIDOPTERA OF NATAL.

By A. J. Spiller.

I should have replied to Mr. Gooch's criticisms respecting my article on the "Rhopalocera of Natal" before this, but observing that a series of papers from his pen on the Lepidoptera of that colony was appearing in the 'Entomologist,' I awaited their conclusion before so doing. I find no fault whatever with Mr. Gooch for thus criticising my article, but at the same time I claim my right to reply to certain misleading statements.

Mr. Gooch too hastily assumes that I intended my article to be exhaustive of Natal Rhopalocera, and expresses regret that I did not communicate with Mr. Trimen in order that it might be more complete. But my object in writing was principally to inform collectors at home of the species that had actually come under my notice during the comparatively short time of my residence here; consequently I do not write about species that were supposed to occur elsewhere, but which had not, up to this time, come under my own personal observation.

Mr. Gooch also objects to my statement that I had captured several new species. I am fully aware that Mr. Gooch had personal acquaintance with the Lepidoptera of this colony for five years, and during that time had only met with one new species of butterfly, *Neptis Goochii;* and therefore it was quite natural that he should have regarded my statement with a certain amount of doubt; but, nevertheless, the fact remains that I have taken some half a dozen species utterly unknown to Colonel Bowker or any Natal entomologist, and which are not included in Trimen's list. It must be remembered that the whole European population of Natal amounts to only 20,000, and that amongst such a sparse population entomologists would be few and far between. With the exception of Colonel Bowker and myself, and two or three "butterfly-catchers," there are at present no other entomologists in the colony; consequently it is not surprising I should meet with species not yet taken by other collectors. I may instance a lovely canary-coloured *Pieris,* which I met with frequently in the woods on the Zululand border, and from the occurrence in the same place of many rare species, such as *Amauris Dominicanus, Pieris Saba, Eronia Argyia, E. Buquetii, Anthocharis Antigone,* &c,, I infer that there they reach about their southernmost limit.

Mr. Gooch refers to a butterfly as stated to be found at the Inanda Hills, and which he believes to be a "myth." His informant, Mr. Macken, was shown this butterfly by the same resident at the Inanda (Mr. Wood), who mentioned the circumstance to me. I therefore went in search of it, and found it to be a splendid large butterfly, although not so "gigantic" as Mr. Gooch was informed. In 1879 I met with a few, but this past April I hunted it well in its very limited locality, and returned with a splendid long series. It expands about three or four inches, and has been named *Debis Indosa.*

Respecting the moths of Natal I found the best way to secure numbers was by light. After the spring rains I generally begin, for with the renewal of vegetation appear vast numbers of insects. My house is situated in the "bush," or rather it has about twenty acres of bushland surrounding it. Several large lamps are placed on a table by a window, the room is cleared of furniture, the windows thrown up, and the lamps left burning until daybreak. When I began this plan of capturing insects I was simply in a state of delightful bewilderment. It would be an impossible task to name the species, as no one in Natal knows the name of our small moths; but amongst the thousand species of moths I have secured are innumerable tigers, leopards, satins, *Saturnias*, *Drepanulæ*, buff and chocolate tips, *Notodontas*, a pretty *Epione* resembling *Vespertaria*, thorns, waves, *Boarmias*, *Eupithecias*, carpets, and *Noctuæ* galore. After a favourable night's work the room presented a strange appearance: some hundreds of moths would be sticking about on the walls, ceiling, and windows; whilst beetles and Orthoptera would be in almost equal plenty. The largest species of moths would expand about six inches, but these species are best obtained by breeding. *Actias Mimosa*, a lovely apple-green moth, is easily found in the chrysalis state in December on branches; they emerge in January, but a few remain over until September. Many other large species, expanding from four to six inches, are found in the larval state on *Mimosa*, cabbage and Kafir boom-trees, and are as attractive to the natives as to entomologists, since I found my Kafir servants were in the habit of appropriating these larvæ from the breeding-cages for the purpose of eating them.

Mr. Gooch also hastily assumes that my "big bush," near the coast, is the one in which he was in the habit of collecting, *viz.* at Avoca, eight miles from Durban. I should be more than surprised to hear of the occurrence of leopards in that district, since it is comparatively thickly populated with Kafirs and Coolies. In the large woods on the coast, going towards Zululand, they occur; and also at the Inanda, where my friend Mr. Wood, a great botanist, has just poisoned an extraordinarily large one, which was in the habit of prowling round his domicile by night.

Mr. Gooch also assumes that I have passed over *Pseudacræa Boisduvalii* and *Tarquinia* for *Acræa Zetes* and *Aganice* respectively. The omission of these from my paper was purely accidental, as they are by no means uncommon on this part of the coast. *P. Boisduvalii* is certainly very like *A. Zetes* on the wing; but I cannot agree with Mr. Gooch that it is impossible to distinguish them apart. Certainly I never had the least difficulty. *P. Boisduvalii* is not only the larger, but is far the brighter coloured; and its flight is not exactly like *A. Zetes*, being an easy floating movement, unless struck at and missed, when it goes off with the speed of a *Charaxes*. *P. Boisduvalii* was very common during the first half of this year, although it is sometimes a very scarce insect. Colonel Bowker informs me that until this season he had only met with four specimens in thirty years.

It is not my intention to refer to the Natal butterflies in detail, but whilst I have pen in hand I may mention a few incidents that may be interesting to entomologists at home.

The early part of the present year (1881) was very prolific in the genus *Charaxes*, since I met with nine different species of this genus. Two of them, *Charaxes Saturnus* and *C. Druceanus*, are of very rare occurrence in this part of Africa; they are both exceedingly handsome insects, the former being bright red-brown, the latter dark red-brown. Another species, generally rare, appeared in considerable plenty, viz. *C. Candiope*, already referred to by Mr. Gooch. I captured about fifty specimens of this large and handsome species, and about the same number of the Natal variety of *C. Xiphares* (*C. Cithæron*). These species were taken by supplementing the exudations from gum-acacias and *Mimosas* with a strong decoction of "sugar." They were taken at various places along the coast, so I imagine their abundance during the past season to have been general; and as late as July I found them flying in woods on the Zululand border. *C. Brutus* was even commoner than the two species just mentioned, as a glance at the long rows in my boxes informs me.

It is very interesting to observe the different "forms" species assume in this country through variations of temperature and other causes. *Papilio Pylades* but rarely appears in the winter, but I captured a solitary specimen during my July trip to the Zulu border that differed very considerably from the ordinary summer forms. The rare *Lachnoptera Agresii*, which occurs at the Inanda and on the Zulu border, possesses certain distinctive marks of difference, the Inanda specimens being brighter than the two individuals taken in the latter locality. I cannot agree with Mr. Gooch in thinking that this insect is commoner than it seems, for in my anxiety to obtain a fine cabinet series I have not passed many *Atella Phalanta* without most carefully noting them.

I certainly do agree with Mr. Gooch in thinking that *Diadema dubia*, *mima* and *Anthedon* are plastic forms of one species, but at the same time the forms are common to both male and female: thus I have taken male *Anthedon* in copulation with female *Mima*, and *vice versâ*. *Eurytela Hiarbas* and *E. Dryope* are, I believe, also varieties of the same species, since I have taken them in cop.; and on the Zulu border, last July, I caught an intermediate variety, the individual being a male, with the markings of *E. Hiarbas*, but the white stripe was replaced by one of dark red-brown, much darker than the usual orange band of *E. Dryope*. As I have also taken *C. Zoolina* and *C. Neanthes* in cop., as well as *J. Archesia* and *J. Pelasgis*, I am inclined to imagine they are likewise varieties of each other. I am, however, quite aware that it is by no means an infallible test of the identity of a species to find two distinct forms in cop., since amongst the orange-tips such a phenomenon is frequently seen. The splendid "mother-of-pearl," too, is by no means very particular with whom it mates; I have taken it on terms of tender intimacy with *J. Archesia* and *P. Merope*, female; and Colonel Bowker assures me he has taken it in cop. with a large day-flying moth, *Aphelia Apollinaris*. Possibly this queer weakness accounts for the peculiar varieties of this butterfly that occasionally turn up: one, being a dark form, almost black; another, shining like polished silver; and another, with a beautifully embroidered border, has been dignified as a distinct species. This latter variety is very rare; I have only caught it on the Zulu border, and at the same time the woods were all alive with the ordinary form floating through the Kafir foot-paths like large patches of polished silver.

Mr. Gooch has referred to two skippers, *Leucochitonea bicolor* and *L. paradisea*, as two butterflies so local that they are confined to a single locality; but I think they will be found in various suitable localities when the colony is more worked. *L. bicolor* I have found at the Inanda Hills; it is certainly not plentiful; but at the same place *L. paradisea* occurs in plenty. Mr. Wood takes it plentifully even in his garden in April. It also occurs at Verulam, where I have taken it in my own garden and grounds; and I have even caught individuals close to Durban. The night-flying skippers, *Pamphila Erinnys*, *P. Fiara* and *P. Dysmephila* are also considered rare; but this is, I believe, entirely owing to their nocturnal habits. *P. Dysmephila* feeds on the date palm, and the larva changes to a pupa enclosed in a cocoon amongst the date leaves. *P. Fiara* feeds on the wild banana palm; this latter species is easily distinguished from the other large skippers by its white antennæ. During last July, whilst exploring the upper part of the coastlands, I put up in a hut in the woods, and every evening during my stay I observed this species flying with great rapidity around the banana palms that abounded in the locality; I managed to secure a considerable number, and also a good supply of eggs, which were deposited singly on the leaves. One of the rarest of Natal skippers is *Caprona Pillaana*, of which species I secured three in 1880; but the most careful searching has revealed no others. Early in the present year an immense swarm of *Crenis Natalensis* (the black form) appeared, and, strange to say, migrated by thousands towards Zululand. In the woods they were in a perfect cloud. On every gum patch they formed a thick black mass, and when the net was placed over such a patch hundreds could be taken at once. The pupæ were to be taken in any number sticking on all kinds of leaves, twigs, &c. About the same time a vast plague of larvæ appeared in the sugar-fields, causing alarm, and filling the minds of the planters with ideas of bankruptcy. I pointed out to them that the larvæ were those of a Noctua, and would in a short time enter the ground, when possibly no such plague would occur again. In two or three weeks they went "down," and the sugar-fields recovered their wonted appearance. At the same time a plague of the larvæ of *Acherontia Atropos* appeared amongst the Kafir "sweet potatoes." Leading articles appeared in the colonial newspapers on these plagues, and a "special" representative of the 'Times of Natal' reported on *A. Atropos* larvæ as "worms about three inches long, amber-coloured, and with quarter-inch bones in their tails."

Verulam, Natal, October 10, 1881.

PS.—The number of species of Natal Rhopalocera captured by me from December, 1878, to October, 1881, amounts to 192.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ*.

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

The *Ichneumones pneustici* have been tabulated by Wesmael as follows. Wesmael's fifth subfamily, the *Ichneumones heterogastri*, which contains but one genus (*Alomyia*), and Gravenhorst's genus *Microleptes* are also added here for convenience sake.

A. Wings with an areolet.
a. Spiracles of the 1st segment of the abdomen situated between the middle and the apex.
* Scutellum but slightly elevated.
† Middle of the apex of the metathorax not elongated beyond the base of the hinder coxæ.
‡ Mandibles bidentate; the upper tooth very stout, lower very short. - - Gen. 1. *Herpestomus*, Wesm.
‡‡ Mandibles with two teeth of almost equal length.
§ 2nd abdominal segment with no impression at the base.
× Mandibles of the female knobbed on the under border; flagellum of male filiform. Gen. 2. *Colpognathus*, Wesm.
× × Mandibles of the female with an entire border on the under side.
o Post-scutellum with pits. - Gen. 3. *Dicœlotus*, Wesm.
oo Post-scutellum smooth; flagellum of male attenuated at the base. - - - Gen. 4. *Centeterus*, Wesm.
§§ 2nd abdominal segment more or less distinctly impressed at the base.
+ 2nd abdominal segment with two pits at the base. Gen. 5. *Nematomicrus*, Wesm.
+ + 2nd abdominal segment with a transverse linear impression at the base.
++ Clypeus, apical margin smooth, or entirely abruptly depressed. - - Gen. 6. *Phæogenes*, Wesm.
++ ++ Apex of clypeus widely scolloped out in the centre. Gen. 7. *Oiorhinus*, Wesm.
++ ++ ++ Clypeus, just before the apical margin, has a small pit in the middle. - - Gen. 8. *Æthecerus*, Wesm.

†† Apex of metathorax prolonged tail-like beyond the base of the hind coxæ. - Gen. 9. *Oronotus*, Wesm.

** Scutellum very convex and prominent.

∽ Metathorax short, supero-medial area transverse linear, petiole rather long. - Gen. 10. *Ectopius*, Wesm.

∽∽ Metathorax not short, supero-medial area not transverse linear.

1st segment rather short.

o Apex of abdomen acute, aculeus of female quite straight. Gen. 11. *Ischnus*, Grav.

oo Apex of abdomen obtuse, aculeus of female curved upwards. - - Gen. 12. *Heterischnus*, Wesm.

b. Spiracles situated in the middle of the 1st segment. *Alomyia*, Panz.

B. Wings without an areolet. - - *Microleptes*, Grav.

These generic characters are not in all cases so precise as could be wished, many of the species having consequently been placed under more than one of the genera, as will be seen on reference to the synonymy in Marshall's Catalogue. Note especially the distribution of the ten species under *Ischnus* in Gravenhorst's 'Ichneumonologia Europæa.' Even the distinctive mark of the subfamily itself—the circular metathoracic spiracles—is shared by a few species which have already been noticed in the last subfamily in the genera *Platylabus* and *Apæleticus*.

HERPESTOMUS, *Wesm.*

A. Post-petiole closely punctured.

Gastrocæli very distinct.

Black or brownish black, margins of segments piceous, antennæ dark; greater part of legs red. - 1. *brunnicornis*, 2½—3 lines.

B. Post-petiole smooth and shining.

Gastrocæli hardly visible.

Thorax with pale line before the wings, apex of scutellum white; abdomen more or less red, femora and tibiæ red; female, antennæ with a pale ring (sometimes obsolete); male, front coxæ pale, hind black. - - - - - 2. *facialis*, 2—2½ lines.

C. Post-petiole distinctly striated.

Thorax black; 2nd to 4th abdominal segments and legs red; apex of hind femora and tibiæ black. - - - *striatus*, 2⅔ lines.

Four Gravenhorstian species are partly referable to *H. facialis*. *H. striatus*, Bridgm., is a species new to science, both sexes of which have been taken at Norwich (Trans. Ent. Soc.

Lond., 1881, p. 145, pl. viii., figs. 1 & 2). *H. brunnicornis* is a common parasite of various species of *Hyponomeuta;* it is partly figured in Vollenhoven's 'Schetsen' (pt. i., pl. iii., fig. 12).

COLPOGNATHUS, *Wesm.*

Scutellum black, 2nd to 4th and 5th segments of the male, 1st to 4th of the female red; legs red; coxæ, trochanters, apex of hind femora, base and apex of hind tibiæ, black; antennæ of female tricoloured (variable in this respect). - - - 1. *celerator*, 3—4 lines.

This species is also figured in Vollenhoven's 'Schetsen' (pt. i., pl. iii., fig. 13). It is apparently uncommon in Britain, notwithstanding what Gravenhorst says. Brischke says it has been bred from *Bembecia hylæiformis**; but Rondani gives *Botys nubilalis* (= *silacealis* = *lupulinalis*).

DICŒLOTUS, *Wesm.*

Antennæ of the female generally red or reddish at the base, the rest dark; the male has the basal joints pale beneath. Scutellum black.

A. Abdomen black; extreme apical margins of intermediate segments castaneous (females).
a. Legs fuscous-black; front femora and tibiæ straw-coloured beneath. 1. *pumilus*, 2—2½ lines.
b. Legs reddish yellow; hind coxæ black. - *Cameroni*, 2 lines.
B. Segments 2nd to 3rd or 4th red, most frequently with black dorsal marks (females).
a. Hind coxæ at least black, or at the base; legs red.
* Entire abdomen punctured; all the coxæ black. 3. *parvulus*, 2 lines.
** 1st segment smooth. - - - - 5. *pusillator*, 2 lines.
b. Coxæ and legs red. - - - - 4. *rufilimbatus*, 2½ lines.
C. Ditto (males).
a. Front coxæ or trochanters white or yellow.
* Segments 2nd to 5th, apex and sides, red; 6th and 7th entirely red. 1. *pumilus*, 2½ lines.
** Segments 2nd to 4th red, mostly with dark dorsal marks; margin of 5th and 6th red. - . - - 2. *ruficoxatus*, 2 lines.
b. Front coxæ and trochanters black. - - 4. *rufilimbatus*, 2½ lines.
D. Segments 1st to 3rd red, 4th partly so, and generally the apical margin of the rest (female).
Legs red; femora partly brown; hind coxæ with a black spot. 2. *ruficoxatus*, 2½—2¾ lines.

The species of *Dicœlotus* are but little known in Britain, although *D. pumilus* is by no means rare. This species is figured by Vollenhoven in his 'Schetsen,' (pt. i., pl. iii., fig. 14). The closely-allied *D. Cameroni* is described in Trans. Ent. Soc.

Lond., 1881, p. 146, pl. viii., fig. 3; one female being taken at Norwich and another in Scotland by Mr. Cameron. Nees bred *D. pusillator* from *Cossus ligniperda* (teste Gravenhorst); and Rondani says it is parasitic on a species of *Notodonta*.

CENTETERUS, *Wesm.*

A. Antennæ of female tricoloured.
Abdominal segments 1st to 4th in female, 2nd to 4th in male, and legs red; apex of hind femora, base and apex of hind tibiæ, black.
a. Antennæ of female black at the base; coxæ, trochanters and thorax entirely black in the female; collar of male white in the middle. 1. *major*, 3—4 lines.
b. Antennæ of female at the base and upper part of the collar, sometimes the sides also, red; legs like *major*, only the male has the hind femora black. - - - - 3. *confector*, 2¾—3½ lines.
B. Antennæ between the base and middle, abdominal segments 2nd to 4th, and legs, red; apex of hind femora, or nearly all of it, base and apex of hind tibiæ, black (female).
Segments 2nd to 4th red-edged, or red marked with black; legs red; all the coxæ, trochanters, hind femora, base and apex of hind tibiæ, black (male). - - 2. *opprimator*, 2½—3¼ lines.

Brischke gives the hosts of two species of *Centeterus*—*C. major* from *Bembecia hylæiformis** and *C. confector* from *Nonagria geminipuncta*. *C. opprimator* is badly figured in Vollenhoven's 'Schetsen' (pt. i., pl. iii., fig. 15). The species are not rare in Britain.

NEMATOMICRUS, *Wesm.*

Extreme apical margin of abdominal segments reddish; orbits of eyes and a line before the wings yellow; legs red; hind coxæ and trochanters black: apex pale (male and female). 1. *tenellus*, 2½ lines.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTES ON IRISH RHOPALOCERA.—In reference to Dr. F. Buchanan White's very interesting paper on the "Distribution of British Butterflies" (Entom. xiv. 266), I think, as far as my information goes, he is mistaken when he includes *Vanessa C-album* in the Irish list. The insect is not mentioned either in the Rev. J. Greene's "List of Lepidoptera hitherto taken in Ireland" (Nat. Hist. Review, 1854, p. 165), or in my friend Mr. Birchall's "Catalogue of the Lepidoptera of Ireland," 1866; and the only observer, as far as I am aware, who has noticed it in

Ireland is the Rev. H. H. Crewe, by whom it was supposed to have been seen at Powerscourt, Co. Wicklow. *Argynnis Selene*, not included as Irish in Dr. White's list, has been taken at Edenderry, Queen's County, as mentioned by Mr. Birchall (Ent. Mo. Mag., vol. xiv., p. 211).—[Rev.] WILLIAM W. FLEMYNG; Portlaw, Co. Waterford, December 2, 1881.

ENTOMOLOGICAL NOTES FROM DOVER.—While collecting at Dover, in August, we found a great many butterflies out, and counted in all over twenty different species on the wing during that month; and this only on the cliffs east of the town. The locality was absolutely swarming with *Lycæna Corydon* and *L. Alexis*, and many good varieties of both were taken. *Polyommatus Phlæas* was common, but not in such profusion; and of *L. Alsus* we only captured two specimens; this might, however, be owing to the prevalence of windy weather. The freshly emerged imagines of *Vanessa Atalanta*, *V. Io*, and *V. cardui* were just beginning to put in an appearance, and on the 15th and 20th of August we took two males of *Colias Edusa* in a lucerne-field by the East Cliff. *C. Edusa* does not seem to be plentiful this season, as only those two were seen during our three weeks' stay. On the grassy slopes at the Zigzag Cliffs, near South Foreland Lighthouse, *Argynnis Aglaia* and *Satyrus Semele* were to be found, but both rather worn; we managed, however, to get two or three of the former in fair condition; and in the same locality we took *Hesperia Sylvanus*, *H. comma*, and *H. linea*, the first-named being the commonest of the three. With regard to moths, we did very little, being unable to do anything in the way of sugar or light; and only a few Geometræ and day-flying Noctuæ fell to our lot. *Fidonia atomaria* and *Aspilates gilvaria* were common among the grass and herbage on the cliffs, and *Bryophila perla* was rather plentiful, being found at rest in the early morning on walls, houses, &c., in the town; but of *B. glandifera* we saw nothing. Perhaps the most common of all was *Zygæna filipendulæ;* it was a usual occurrence to see three or four of them on a single flower-head of scabious or knapweed, and the cocoons abounded everywhere; some that we noticed were fixed to the chalk-cliffs somewhat in the manner of a *Pieris* chrysalis.—T. GOWLAND; Enfield Buildings, N., October 6, 1881.

LEPIDOPTERA IN THE ISLE OF PURBECK.—I am not aware that any list of the insects occurring in the Isle of Purbeck has been published, so that perhaps the following list of rare or local insects, taken by myself (without any attempt at systematic collecting) at different times in the island, may interest some of your readers:—*Lithosia quadra*, *Acidalia contiguaria*, *Macaria alternata*, *Camptogramma fluviata*, *Stauropus fagi*, *Triphæna subsequa*, and *Dasycampa rubiginea*, single specimens. *Lobophora sexalata*, *Xylina semibrunnea*, *X. petrificata*, and *Lycæna Adonis*, several specimens. *Lithosia stramineola*, *Emmelesia albulata*, *Anticlea rubidata*, *Agrotis saucia*, and *Xylina rhizolitha*, commonly. *Argynnis Aglaia*, *Arge Galathea*, and *Scodiona belgiaria*, are abundant on the range of chalk downs for, I believe, their whole length from Lulworth to Studland. *Charæas graminis* and the larvæ of *Cucullia verbasci* are also sometimes abundant. *Lycæna Corydon* is also abundant in the corn-fields to the north of that range, though I have never met with it on the south side. *Phibalapteryx tersata*, *P. vitalbata*, *Melanippe procellata*, *Eubolia bipunctaria*, and *Ilithyia carnella*, are common in many places; whilst *Lycæna Ægon*, *Fidonia atomaria*, *Selidosema plumaria*, and some species of *Psyche* are very common on the heaths lying between East Lulworth and Wareham. I feel sure that were a good entomologist to devote some time to collecting in the Isle of Purbeck he would be rewarded with many other local species than those mentioned, and very possibly something new, especially in the genus *Acidalia*, as I once had two or three examples of a species that appeared to belong to that genus that I could not refer satisfactorily to any in our list. They were taken on the open downs towards the south of the island, and appeared allied to *A. contiguaria;* but circumstances obliging me to give up collecting for several years they were destroyed without being shown to anyone competent to decide on their identity.—THOS. PARMITER; Halstock, Yeovil, November, 1881.

HESPERIA ACTÆON.—I have for several years been expecting to see some such note respecting *Hesperia Actæon* as that from the pen of Mr. M'Rae (Entom. xiv. 252). From what I know of the habits of that species, I have long felt certain that if it were not entirely exterminated at Lulworth it would be so reduced in numbers as to become a great rarity there; though were such to be the case I have every reason to believe that it would still be found in some other part of the Isle of Purbeck, as I know it to have been taken abundantly in another locality near Swanage. I most sincerely hope, however, that Mr. M'Rae's advice will be taken, and all worn specimens allowed their life and liberty, the more so that I believe it to be invariably the habit of the larva to feed in a very limited area, and never farther from the sea than that its food can at times be wetted with the sea-spray. In support of this I may perhaps mention that I have several times searched the downs for several miles on either side of Lulworth, and, though its food-plant grows abundantly on all the downs, I only met with one specimen, and that at no great distance from the ordinary locality.—THOMAS PARMITER; Halstock, Yeovil, November, 1881.

HERMAPHRODITE HYBRIDS.—Having had my attention directed to the 'Entomologist' on the above subject by a friend, I saw the sketch of the insect (Entom. xiv. 217), and I am inclined to think it is one that I bred some eighteen years ago. I was glad to find in the next number (Entom. xiv. 253) that Mr. Kirby had replied to Mr. Briggs. I can fully endorse all that he says, having noticed the same circumstances that Mr. Howse speaks of. I bred both *ocellatus-populi* and *populi-ocellatus*, and distributed them in different parts of the country. I am not in possession of any now, and have given over collecting; but I shall have great pleasure in giving any information that I am able to any of your readers on the subject.—JOHN ADAMSON; 5, Darncombe Street, Moss Side, Manchester, December 15, 1881.

ORGYIA PUDIBUNDA DOUBLE-BROODED.—Last June I obtained a number of eggs of this species, and from these I had about two hundred pupæ. I was much surprised to find the imagos appearing on the 5th of this month, and since then twenty more have come out. Is this not a very unusual occurrence?—L. F. HILL; 4, Craven Terrace, Ealing, W., November 24, 1881.

ENNOMOS AUTUMNARIA AT FOLKESTONE.—On the evening of the 1st October I had the good fortune to take two fine specimens of this rare moth from street lamps in the outskirts of this town. —W. J. AUSTEN; Radnor Street, Folkestone, Nov. 21, 1881.

AMPHYDASIS BETULARIA IN IRELAND.—As this insect is not included in Mr. Birchall's list nor supplement, the occurrence may be worth recording. I met with a single specimen in the garden in Kingstown last summer, and the insect is now in the collection of my friend Mr. Kane.—W. E. GLAZEBROOK; Science and Art Museum, Dublin.

ABRAXAS ULMATA.—Referring to the remarks made by Mr. A. T. Mitchell, in the November number of the 'Entomologist' (Entom. xiv. 257), I may mention that during the early part of October I received larvæ of the above species from Sheffield, and owing to the difficulty after a week from that time in obtaining their food, the wych elm, most of the larvæ either died or changed to the pupa state while very small. This evening, on looking into my glass cylinder where I kept the larvæ, I found that two imagos had put in an appearance, very small, though perfect, specimens.—J. R. WELLMAN; 219, Elm Park, Brixton Rise, S.W., November 18, 1881.

EUPITHECIA ULTIMARIA, *Dup.*—I was very pleased on reading the remarks made by my friend Mr. Sydney Webb about this species in the last number of the 'Entomologist' (Entom. xiv. 300). I was quite satisfied myself at the time I took this species that it was perfectly distinct from *E. sobrinata;* its habits and time of appearance are very different, and if a set of each are placed side by side the difference is very perceptible. Besides many other characters it is much lighter and brighter; it varies quite as much as *E. sobrinata.* I have three specimen varieties, ticketed, in my cabinet, which I sent to Guenée, and he returned them in doubt as the *Eupithecia ultimaria* of Dup., not knowing that species. At the time of capture, or soon after, I forwarded specimens to Messrs. Doubleday, Allis, E. Shepherd, F. Bond, S. L. Waring, F. Grant, J. B. Hodgkinson, P. H. Vaughan, J. J. Weir, H. T. Stainton, J. W. Douglas, Major Sheppard, Sircombe, Greening, Edwin Brown, J. Hunter, and, more recently, Howard Vaughan. I have never been to the spot, where I captured them in the evening, since that time, which must be at least twenty-five years ago.—SAMUEL STEVENS; Loanda, Beulah Hill, Upper Norwood, December 7, 1881.

SCARCITY OF EUPITHECIÆ LARVÆ.—During the last week in September I went twice to Bishop's Wood, near Selby, in this county, to work for larvæ of *Eupithecia albipunctata* and *E. trisignata.* I was much surprised to find none of either species. In former years it was abundant, and I could take large numbers in the same locality. I also went to two localities for *E. centau-*

reata and *E. absynthiata*, and there was the same rarity of those species. Not a larva to be found. *E. pimpinellata* six years ago was so common that I could get any quantity of larvæ close at home, and this year it took me one whole day to find four individuals. The larvæ of *E. castigata* I have not seen at all this year, although we usually find it on almost every plant. *E. subfulvata* seems to have quite deserted the yarrow.—W. Prest; 13, Holgate Road, York, October 16, 1881.

Coremia quadrifasciaria.—In continuation of the notes on this species, in the October number of the 'Entomologist' (Entom. xiv. 229), perhaps my experience of its occurrence in Suffolk will be interesting. I have met with it in several localities, at Bentley, Felixstowe, and around Ipswich, but nowhere abundantly. It usually occurs in lanes and hedgerows, rather than woods; and an evening's "mothing" early in July will generally yield two or three specimens.—H. Miller; Ipswich, October 24, 1881.

Cirrœdia xerampelina in Somerset.—I caught a specimen of this moth on a grass lawn in front of my house on September 18th. There is a gas-lamp near, which had probably attracted it.—W. Macmillan; Castle Cary, Somerset, Nov., 1881.

Lepidoptera at Southwell.—I have captured, this year, at Southwell, in Nottinghamshire, the following far from common insects:—In September the imago of *Sphinx convolvuli*, found on a gate-post, and given to me. Also I took one specimen of *Aplecta occulta* at sugar on some iron fencing; and last, but not least, the larva of *Acronycta alni*, which I fear is dead. This last was found on a road under overhanging elm and beech trees.—W. Baker; Hill House, Southwell.

Scarcity of Noctuæ in Somersetshire.—Noctuæ have been very scarce at sugar this autumn, notably the commoner species. Not a single specimen of *Anchocelis pistacina*, *Cerastis vaccinii*, or *C. spadicea*, of which I generally see dozens. Only one *Phlogophora meticulosa* or *Agrotis puta*, very few *Mamestra brassicæ*, *Xylophasia polyodon* or *Triphæna orbona*. No *Catocala nupta* or *Xylina semibrunnea*, of which, with *X. petrificata*, I generally take a few. *Sphinx convolvuli* has not been uncommon, and of *Acherontia Atropos* larvæ several specimens have been found. Allow me to add that my old acquaintance *Polia flavocincta* has been constant to me, and I shall be glad to forward to anyone wanting the species, on receipt of box and return postage, a series of six, as far as they will go.—[Dr.] H. W. Livett; Wells, Somerset, October 14, 1881.

Life-history of Plusia bractea.—I have found that if a worn female of *Plusia bractea*, when captured, is placed in a large chip pill-box, in which a small aperture has been left for air, and the box is placed in a window upon which the evening sun shines, she will probably deposit some eggs. These are almost the colour of the chip upon which they would be laid, and are very small in proportion to the size of the insect. Later in autumn the eggs will hatch, and the young larvæ feed and grow till they are about half an inch in length, and are in colour a dull green. In spring they begin to feed vigorously and increase in size, and can then be distinguished from the larvæ of *P. V-aureum* by the segments being more marked and indented. As they grow they become of a richer and brighter green; and when about to spin up the caterpillar of *P. bractea* is a handsome larva, upwards of an inch in length, with only six prolegs; the anterior legs are generally black. It has a habit of elongating all the anterior segments, making them look very slender in comparison with the rest of the body. The dorsal line is very narrow, of a darker green than the ground colour, and between it and the spiracular lines are three wavy white lines; but all these markings are so minute that at first sight the larva appears of a uniform green. All the body below the spiracles is of a darker green than the upper surface; the face, which is almost flat, has a black stripe at each side; the mandibles are also black, and two prickly points on the last segments are dark in colour. The larva is sprinkled all over with almost invisible white hairs, which show at once if it is held against the light. It spins a white silky covering, through which the dark chrysalis can be seen; the cocoon is completed about the end of May or beginning of June. The imagos appear in June or the beginning of July; they are particularly fond of the flowers of honeysuckle and *Viola cornuta*, which they frequent just before dark, in company with *Plusia V-aureum*, *P. iota* and *P. chrysitis*; possibly, but rarely, with *P. interrogationis*. About four years ago I succeeded in rearing five splendid *Plusia bractea* on groundsel alone. When they were large enough to take out of the glass-topped box, a healthy young groundsel was placed in the centre of a flower-pot, and sandy earth filled in; round the inside rim of the pot four or five slender sticks were inserted and tied together at the top. Over all a muslin bag was placed and fastened round the flower-pot by an elastic band. Each time the plant became withered and sodden, and had to be changed, the little larvæ had to be diligently sought for, as they have a habit of burying themselves beneath the surface of the ground, and require sharp eyes and some patience to find them. My next essay was in 1881, when seven imagos rewarded my care. I gave these larvæ of *Plusia bractea* grass as well as groundsel, and they apparently enjoyed it, creeping up the stems and nibbling the blades; but I have reason to think this food did not agree with them, for when nearly full grown they suddenly ceased feeding and began to spin up: twenty-three cocoons clustered together on the stems of grass, and a few others on the muslin bag; seven only emerged, and after waiting patiently I opened a cocoon, and found the chrysalis contained a dark fluid; all the others were similarly decayed. A friend, with whom I shared my eggs, reared nine beautiful specimens successfully upon groundsel, young honeysuckle, nettles, and cow-parsley (*Chærophyllum sylvestre*), remarking that in spring the larvæ seemed particularly fond of the latter plant. Probably a more varied diet might have saved some of my caterpillars from dying in the pupa state, had I thought of it in time. I am sorry to say I have no duplicates to offer; as yet I have been unable to supply even my friends' cabinets with this rare moth, which is so capricious in its appearance that during some seasons not even one specimen is secured.—FRANCES ISABELLA BATTERSBY; Cromlyn, Rathoven, West Meath, Ireland, December 7, 1881.

LEPIDOPTERA ATTRACTED BY ELECTRIC LIGHT.—Noticing in a recent number of the 'Entomologist' that several correspondents had noticed the attractive power of the electric light for Lepidoptera, it may interest some of the readers to know the result of occasional collecting at the electric light, which is being used in this town (Eastbourne) by the contractor for the new sea-wall. In the middle of June, hearing from a lad "that there was a rare sight of owls at the electric light," I paid it a visit, and found that insects literally swarmed around it. I soon commenced operations, and had my boxes full in a short time. Amongst the species I had were *Arctia fuliginosa*, *Notodonta dictæa*, *N. ziczac*, *Dicranura vinula*, which, with *Pygæra bucephala* and *Amphydasis betularia*, came up rank upon rank; I had also *Dianthœcia conspersa* and *Cucullia umbratica*. I felt very well satisfied with my first night's work, and was just packing up to go when down dropped a fine *Smerinthus ocellatus* on the beach in front of me. I had scarcely bottled him when down came a splendid *Chœrocampa porcellus*, followed by *C. elpenor* and *Sphinx ligustri*. It was very interesting to note the effect the light had upon different species: some, such as the *Sphingidæ*, when within three yards of the light dropped on the shingle as if paralysed; whilst others, such as our troublesome friends *Triphæna pronuba* and *Plusia gamma*, &c., went dashing against the carbon as if leading a forlorn hope. I have observed, too, that some species delight in having a night to themselves: for instance, I visited the light about the end of June, and *Zeuzera æsculi* came up in swarms, while next night there was not one to be seen. Later on *Chelonia caja* and *Bombyx quercus* had a benefit night. I have worked this light at odd times up to the end of September, and have taken seventy different species, none of them very rare, but affording sport and interesting observation. Amongst others I have taken *Cossus ligniperda*, *Lithosia quadra* (female), *Liparis monacha*, *Ennomos tiliaria*, *E. fuscantaria*, *E. erosaria*, *Platypteryx falcula*, *Clostera curtula*, *Ptilodontis palpina*, *Bryophila glandifera*, *Nonagria typhæ*, *Agrotis aquilina*, *Noctua glareosa*, *Agrotis saucia*, *Epunda lichenea*, *Plusia festucæ*; and saw *Sphinx convolvuli*, but out of reach. I think I can safely say that if the light had been worked more often I should have been able to record some rarities taken which occur about here.—JAMES T. DEWEY; 11, Tideswell Road, Eastbourne, November, 1881.

PLAGIODERA ARMORACIÆ, *L.*—I notice some remarks upon this beetle, by the Rev. W. W. Fowler, in the December issue of the 'Entomologist' (Entom. xiv. 293). Having lately received a series of the insect, together with a short account of its habits, from Mr. G. Lewcock, I append, with his permission, an extract from his letter:—"I have taken *P. armoraciæ* several years. I find it extremely local, occurring on about nine willow trees only, and seeming never to leave their locality. It prefers the trees situated on banks of small streams, and may be observed early in August on any herbage growing beneath the willows. As the cold season approaches it hybernates beneath the bark of trees, not showing preference for rotten or sound ones. I have found specimens as early as August 5th, and through the winter up to April and May." This would seem to prove that the insect is less rare than is generally supposed; it may, possibly, be often passed over as the common *Phædon cochleariæ*, to which it bears a considerable resemblance.—THEODORE WOOD; 5, Selwyn Terrace, Jasper Road, Upper Norwood, December 8, 1881.

THE GENUS PHÆDON.—There is one error in Mr. Fowler's, otherwise valuable, paper on the above subject, which I venture to correct. In the paragraph headed *Phædon cochleariæ* (p. 294), Mr. Fowler says, "This is the insect referred to . . . . . . by Mr. Hart." This, however, is not the case. I am well acquainted with *P. cochleariæ*, and find it abundantly on watercress, but have never found *P. betulæ* in its company, although I have examined hundreds of specimens in that expectation. I meet with *P. betulæ* most commonly in flood-refuse, but have on a few occasions found it on water-starwort, at which times the beetles have been paired, and apparently quite at home. The object of my query (Entom. xiv. 187) was to ascertain if others had observed the habits of the insect more closely than I had been able to do; certainly not to raise the question of synonymy. During the last two seasons I have paid considerable attention to our common phytophagous beetles, with a view to better understand the economy of those that injure our crops, and my observations lead me to believe that of the common species of *Phædon*, *P. cochleariæ* is the only one that habitually feeds on *Cruciferæ*. Of course it is well known that insects sometimes forsake their regular food-plant, and attack another of quite a different order, as, for instance, *Gastrophysa polygoni*, leaving the knot-grass and attacking barley. It would also seem that a certain species does not always feed on the same plants, or even the same order of plants, in two different countries. I believe it is Kirby and Spence who mention that the elm trees near Paris were severely injured by *Galeruca calmariensis*, which beetle in this country feeds on the purple loose-strife. However, it requires further and extended observations yet to decide what is the food-plant of many of our beetles; and I hope in the spring to again look into the subject, when I shall endeavour to make use of the information contained in Mr. Fitch's note in reply to my query. In reference to *P. tumidulum*, I may add that I have commonly seen this beetle feeding on the leaves of *Heracleum sphondylium*, sometimes in great numbers, but, as yet, on no other plant.—THOS. H. HART; Kingsnorth, December 8, 1881.

ADDITIONS TO NOTES ON DIPTERA.—In the few observations which I published in the last number of this Journal on Parasitic Diptera and their victims (Entom. xiv. 285) I made several omissions, which I am glad to have an opportunity of correcting. Mr. Bignell has written to remind me that he sent me, some time back, two specimens of EXORISTA LOTA, Meig., which he had bred from larvæ of *Acronycta psi;* also one of SCOPOLIA OCYPTERINA, Zett., reared from *Pterophorus tephradactylus;* he has now forwarded me several other Tachinids, lately bred by him, which I have great pleasure in adding to my list; they are as follows:—1, EXORISTA VULGARIS, four varieties? parasitic upon the four following Lepidoptera, viz., *Pieris rapæ*, *Mamestra persicariæ*, *Tæniocampa populeti*, and *Oporabia dilutata.* 2, EXORISTA GNAVA, Meig., from *Orgyia pudibunda.* 3, EXORISTA FAUNA, Meig., from *Cossus ligniperda;* and PHOROCERA CONCINNATA, Meig., from *Notodonta chaonia.* Mr. Fletcher has been good enough to send me a notice of the following additions which he has made to the list of parasites which he has bred, viz., EXORISTA VULGARIS, from *Plusia gamma* and *Vanessa urticæ;* THRYPTOCERA SETIPENNIS, Fall., from *Coccyx strobilella;* and a small species of DEGEERIA, from *Tinea cloacella.* The two last he sent to me for examination a year or two ago (when I could not satisfactorily determine the name of the *Degeeria*), but I had forgotten the circumstance when I drew up my paper; Mr. Fletcher also sent me at that time a specimen of EXORISTA FESTINANS, Meig., but did not know the name of the larva from which it was bred, only that it was lepidopterous. Among the general remarks which I made upon parasitic flies, I mentioned that I had received some specimens of *Dilophus vulgaris* from Mr. Bridgman, said to have been reared by Mr. F. Norgate from *Catoptria hypericana;* I have since had some correspondence with the latter naturalist, and find that a mistake has been made; and that the above-named flies must have been mixed up and confused with some parasitic species which had been lost.—R. H. MEADE; Bradford, December 17, 1881

THE ENTOMOLOGIST.

Vol. XV.] FEBRUARY, 1882. [No. 225.

THE LINNEAN ORDER NEUROPTERA.

By James J. King.

Why is it that we have so few entomologists in this country who will devote their attention to anything excepting the Lepidoptera and Coleoptera, to the utter neglect of many other groups that are in no way less interesting? This is a matter that has occupied my attention for some time, seeing that we have so many orders of insects that are no less attractive, and whose history is almost unknown.

No doubt, during the last few years, we have had a small number of workers who have taken up the Hemiptera and Hymenoptera, but I am sorry to say that the workers at that most interesting and beautiful order of insects, the Neuroptera, might almost be counted on the fingers of a person's hand. Why this should be the case I cannot understand, seeing that we have such great diversity of form and colouring among the various species of this order, many of which, for example, *Cordulia* and *Calopteryx* among the dragon-flies, are adorned with most gorgeous metallic colours.

I think that I could do no better than enter into a short description of the most characteristic of the Neuroptera. This order, as generally understood in this country, embraces groups of very unequal systematic value.

Some of the Neuroptera are closely related to the Orthoptera, as will be seen from the structure of the wings, which are of a membranous character and are traversed by a large number of veins which form little facets from which light is reflected.

The Trichoptera are evidently nearly allied to the Lepidoptera, many of the *Leptoceridæ* bearing considerable resemblance to moths. Doctors differ very considerably on the question of the nearest allies of the Trichoptera. Our greatest living authority on the group lays great stress on their resemblances to the Lepidoptera. Prof. Westwood also wrote long ago that the genus *Phryganea* "forms the connecting link between the Neuroptera and Lepidoptera." On the other hand, the well-known American entomologist and, be it said, embryologist, at the same time, Dr. Packard, maintains as strongly their affinities. A discussion of the *pros* and *cons* in the matter would, however, be out of place in a paper like the present.

Some entomologists divide the Linnean order Neuroptera into two independent orders, owing to variations in the metamorphosis and the development of the mouth-organs: in some species, such as the dragon-flies, these organs are highly developed, which gives to the species that bear them great advantages in attacking their prey; whilst in others, such as the Trichoptera, they are not adapted for any serious work. But, for our purpose, I think that we will adopt the three suborders used by Mr. M'Lachlan in his 'Catalogue of British Neuroptera,' namely, Pseudo-Neuroptera, Neuroptera-Planipennia, and Trichoptera.

Under Pseudo-Neuroptera come those lovely little insects the *Psocidæ*, which abound during the summer in the foliage of various trees, such as firs, yews, &c. Some genera of the *Psocidæ* are not at present so well understood as is desirable, there being no doubt a good deal to do among many of the more obscure inquilines. Many species, again, are only too well known to collectors of natural objects as things to be dreaded rather than admired, such as *Atropos divinatoria*, *Clothilla pulsatoria*, *Cæcilius pedicularius*, &c. Uneasy is the head of him who keeps a collection, for species like those just mentioned cause him to take perhaps rather more interest in his stored favourites than their individual merits might otherwise call for. In this family we have in Britain about thirty species. Micro-lepidopterists could easily take up these living atoms, as they must come across most of the species while searching for micros.

Other groups of the Pseudo-Neuroptera are the *Perlidæ* or stone-flies, and *Ephemeridæ* or May-flies, insects which all anglers, as well as entomologists, must be acquainted with.

The Stone-flies are at present very little understood, owing in great part to the difficulty in studying them, as they shrink up unless preserved in fluid. About a couple of dozen species are recorded as occurring in this country.

The *Ephemeridæ* or May-flies are easily known from the shape of the wings, their very short antennæ, and also by the possession of two or three long setæ, which project from the anal segment; the setæ are often as long as or longer than the wings. Some of the stone-flies have long setæ, but these can be at once separated from the May-flies by their long antennæ, ample hind wings, &c. About forty species of May-flies occur in this country. The best method of preserving the stone- and May-flies is in fluid. The Rev. A. E. Eaton, the best authority on the May-flies, says, "It is sufficient for ordinary purposes to dip the freshly-killed specimen into dilute spirits, and then transfer it to a tube or homœopathic globule bottle partly filled with water; next, Price's glycerine is added to the water,—one or two drops a day,—until the bottle is gradually filled. A small drop of acetic acid may be added finally, to prevent the growth of mould."

The *Odonata*, or dragon-flies, are familiar to all who may ever have happened to take a walk during a warm summer day near a weedy pond, where these insects may be seen hawking after their food, *viz.*, small insects, or carrying on a very important duty, their amours. I know no more beautiful sight than that of a few of the "Devil's darning-needles" (as they are familiarly called in Scotland) making their exquisite curves while chasing one another in some quiet glade near a picturesque pool. About half-a-hundred species are known to occur in Britain, of which many are adorned with the most brilliant metallic colours, which do not fade; unfortunately a few of the more tender-bodied ones do fade, but then it is always possible to pick out a few from a series that have retained most of their colour. It must also be borne in mind that specific distinction depends more on structure than on colour in the Neuroptera.

The second suborder is the Neuroptera-Planipennia, or lace-wing flies, which are no doubt the most lovely of all the British Neuroptera, one or two of the dragon-flies excepted, many of the species rivalling any of the Lepidoptera in beauty of colour, although the colours in the *Planipennia* are produced by different means, namely, by iridescence. Characteristic insects of the group are the following: the *Raphidiidæ*, insects that are remarkable for the elongate development of the head and prothoracic segments, which has caused them to be called snake-flies. The larvæ of the *Raphidiidæ* live under the bark of trees, where they prey upon other small insects. The *Osmylidæ* are not very numerous in this country; but one species, *Osmylus maculatus*, Fab., is truly a handsome creature; it may be taken by beating, over a net, the bushes, &c., that overhang streams. The *Hemerobiidæ* consist of eighteen species, which are very unequally divided among four genera, the genus *Hemerobius* alone absorbing thirteen species. The larvæ probably partake of the habits of the *Chrysopidæ*. The imagos as a rule feign death when beaten into the net, and if you have had a long "beat" it is surprising to see the numbers that are constantly cropping up while you are examining the contents of your net. Many of the species are extremely pretty both in markings and colour, notably *H. atrifrons*, M'Lach.; *H. pini*, Steph.; and *H. concinnus*, Steph.

We now come to the insects that I believe all people admire; at least I know that most of those who care for insects are attracted by them, for when I ask any of my correspondents if they ever take Neuroptera I am pretty sure to get a few *Chrysopidæ*, that is to say, should I by chance get anything at all.

The *Chrysopidæ* are those gauzy-looking green creatures with golden eyes, from which latter character comes their popular name of "golden eyes." Some species are also called "stink-flies," from a very disagreeable odour they give out when caught. These insects are very common in woods; they seem not to be endowed with any great power of flight.

The *Coniopterygidæ* are very minute insects, covered with a fine mealy substance of a slightly violet tinge, which rubs off very readily; the three species that occur here are to be beaten out of trees almost everywhere.

The *Panorpidæ*, or scorpion-flies, so named from the formidable-looking appendages of the male, which give to these insects a dangerous appearance, are not numerous in this country, only three species of the genus *Panorpa* being at present known; these species occur somewhat commonly among rank herbage.

The third suborder of the Neuroptera (Trichoptera) will now take up our attention, and, to use the words of one author, "We meet with a number of flies of no particular beauty, but which, from the peculiarities of their structure and habits, are of considerable interest to the entomologist." With regard to the first portion of this quotation, I may say that there will always be some people who will differ from others as to what constitutes beauty.

These insects in their larval state are almost all aquatic; they build for themselves cases composed of any materials that may come handy: some species make their cases of grains of sand, fixing them together by means of delicate silken threads which the larva spins from a spinneret situated beneath the labium; others, again, use shells, stones, and stems of aquatic plants.

The British Isles are about as well represented as to number of species as almost any other country, the number recorded from Britain being upwards of one hundred and fifty species, which are distributed among seven families, the *Limnophilidæ*, *Leptoceridæ*, and *Hydropsychidæ* absorbing most of the species; the *Limnophilidæ* being represented by fifty-two species, the *Leptoceridæ* by thirty-two, and the *Hydropsychidæ* by thirty-one. Many of these insects attain a large size, *Halesus digitatus* being nearly two inches in expanse of wing; many other species approach this size.

The *Leptoceridæ* are remarkable for the length of their antennæ; in many species these organs are much longer than the wings. Some species of this family are very handsome, *Mystacides azurea* being of a lovely steel-blue; *M. longicornis* is beautifully banded, reminding one of the Lepidoptera; while *Setodes argentipunctella* is spotted with small silvery scales.

The *Hydroptilidæ* form a small family of insects that might easily be mistaken for Lepidoptera, so closely do they resemble some of the *Elachistidæ* in their general appearance.

The caddis-flies are only to be made out with certainty by an examination of the anal characters, more particularly those of the male. Caddis-flies are to be found in almost all situations where water occurs, the *Limnophilidæ* delighting in stagnant water; others visiting streams to pass their larval state; while for some species, such as *Chimarra marginata*, the highly aërated water of a mountain torrent is necessary for their existence. Some species, probably of strong flying powers, are to be found far removed from water.

I think that I have said sufficient to show that we have infinite variety in the Neuroptera; so that the most fastidious may easily get some group to please him, and also that they are to be found in as many localities as Lepidoptera, and in fact can easily be collected with them.

I should not close this paper without giving a hint as to the literature bearing on the Neuroptera. I will only refer to books published in England:—"A Catalogue of British Neuroptera," compiled by Robt. M'Lachlan, F.L.S., and Rev. A. E. Eaton, B.A.; published by the Entom. Soc. Lond., 1870. "A Monograph of the British *Psocidæ*," by R. M'Lachlan, F.L.S.; published in the Ent. Mo. Mag., vol. iii., 1867. "A Monograph of the *Ephemeridæ*," by the Rev. A. E. Eaton, B.A., in the Transactions of the Entom. Soc. Lond., Part i., 1871. "A Synopsis of the Dragon-flies," by Dr. Hagen, in the Entomologist's Annual, 1857. "A Monograph of the British Neuroptera-Planipennia," by R. M'Lachlan, F.L.S., in the Transactions of the Entom. Soc. Lond., Part ii., 1868. 'A Monographic Revision and Synopsis of the Trichoptera of the European Fauna,' by R. M'Lachlan, F.R.S., F.L.S.; published by John Van Voorst, London. As yet we have not a Monograph of the *Perlidæ* in English, but I may mention Pictet's 'Histoire Naturelle générale et particulière des Insectes Névroptères, Famille des Perlides,' Geneva, 1841-42.

As to preserving: the Neuroptera should all be pinned, with the exception of the *Perlidæ* and *Ephemeridæ*, which are best preserved in fluid as above described; the pin should be driven so far through the thorax that no part of the insect, when set and pinned into the case, will touch the paper. Carding Neuroptera should always be avoided, as it is impossible to examine the under side, &c., if so prepared.

In conclusion, I may state that I shall be most happy to render assistance to anyone who may take up any section of this much-neglected order, by sending types or naming specimens, excepting in the *Perlidæ* and *Ephemeridæ*.

207, Sauchiehall Street, Glasgow, November, 1881.

CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI.*

By Richard South.

(Continued from vol. xiv., p. 77.)

It has been suggested to me that in drawing up my list of the British *Pterophori* (Entom. xiv. 50) I did not pay sufficient attention to the priority of synonyms. I admit that possibly such may have been the case, but confess that I feel greater interest in the investigation of habits of the group, than in working up the entomological literature of the remote past to discover who was, or was not, the original nomenclator of this or that species. In this I may evince a lack of scientific precision, but I submit that although the priority of nomenclature is of great importance, still it is not the first matter to be considered in the study of any group of natural history objects. Let us become thoroughly acquainted with the objects themselves, then we can proceed to discuss the question of priority of synonyms.

In the present paper I shall speak of the "plumes" captured by me in North Devon last season, and in so doing will adopt the generic nomenclature as given in my list (Entom. xiv. p. 75), thus anticipating possible objections on this score.

Platyptilia, Hüb.
Trigonodactylus, Haw.
Gonodactyla, W. V.?

Imago.—Expanse, 10–12 lines. Fore wings, ground colour whity brown, sparingly sprinkled with brownish scales. The most prominent markings are a brown triangular blotch on the costa, the apex of which is situated just before the digital juncture. The posterior edge of this triangle is margined with whitish, most conspicuous on the costa; beyond this is a brown linear mark, also on the costa, followed by a narrow whitish line running from costa to inner margin through the digits, and parallel with the hind margin. Fringes pale grey, with a tuft of black scales, in middle of inner margin, also at tip and angle of inner digit; but these two last are not conspicuous. The tip of outer digit is not produced, and hardly pointed. Hind wings grey-brown; third feather with a tuft of black scales in the cilia of its inner margin; between this tuft and the base of the feather the cilia are whitish. Head and thorax same colour as fore wings.

Larva.—Length 7 lines, moderately stout. Head shining black, and but little smaller than 2nd segment, the upper part of which segment is also shining black. Ground colour whitish, with a broad dorsal and narrower subdorsal stripe rosy brown. Several small black warts, from which short black hairs are emitted, are scattered over the dorsal and subdorsal areas; these are rather larger on the 3rd segment. There is also a row of larger black warts along the spiracle line.

The larva feeds in flower-heads of *Tussilago farfara* during April and May.

Pupa.—Upper part like the larva in coloration, but paler, and not hairy. Wing-cases light brown, more or less streaked with darker. May be found among seed-down, in heads of food-plant, in May.

It will be observed that the description I have given of the imago is not that of the ordinary form of *P. trigonodactylus.* Again, compare my description of the larva with that given by Mr. Peers (Entom. ii. 38), and it will be found that a very material difference exists. Mr. Peers says of the larva he describes, "dorsal line light brown; subdorsal line broader, lighter brown; head and 2nd segment fulvous." Here, then, is either discrepancy or descriptions of the larvæ of two very closely-allied species, sufficiently distinct as larvæ, but not easily separated as imagines. I have no reason to doubt the accuracy of Mr. Peers's observations, as recorded, more especially as all the imagines bred from my larvæ were of the same pale colour, and uniform in the character of the apex of anterior wings, in both respects differing from the examples of *P. trigonodactylus* which I had usually taken in the imago state in other parts of England.

I have before me just now my bred series, and a set of captured specimens from Kent and elsewhere, including one or two taken in North Devon, qûite a month after my last pupa had disclosed its imago. The best comparison I can make between the two sets is to say that the bred insects look bleached and worn by the side of the captured specimens.

Mr. Doubleday would appear to have had some doubt as to whether *P. gonodactyla*, W. V., was synonymous with the *P. trigonodactylus* of Haworth; at least I take this to be the meaning of the ? after *P. gonodactyla* in his synonymic list.

I believe my North Devon insects to be identical with the *P. gonodactyla* of the Continent, and I think it may be found that we have two species in our cabinets under the name of

Platyptilia trigonodactylus ; but I am not at all satisfied with my present knowledge of this species, and shall feel greatly obliged to anyone who will kindly favour me with a few full-grown larvæ of the coltsfoot-feeding "plume" from any locality, during the season. Mr. Sang was kind enough to send larvæ from Darlington, but I did not have an opportunity of seeing them, as I had written to Mr. Carrington that I had found coltsfoot-feeding "plume" larvæ in North Devon, and it was not considered necessary to forward other examples.

PLATYPTILIA, Hüb.

Zetterstedtii, Zell.

IMAGO.—Expanse, 10–14 lines. Fore wings, ground colour whitish ochreous, with a few brown scales scattered over the disk of the wing. A dark brown triangular mark is seated on the costa just beyond the middle, the apex of which is near the digital juncture. On the costa, between this triangle and the base of wing, is a series of dark brown (in some specimens approaching black) spots of small size, and often so closely placed as to give the appearance of a line. The posterior edge of triangle is margined with a dash of the ground colour, and beyond this both digits are suffused with paler brown, in some examples almost black on the costa, and intersected by a line of the ground colour running parallel with the hind margin; the hind margin itself is distinctly outlined with black. Along the inner margin, a short distance from the base, is an oblique dash of dark brown, and a little outside this, but nearer the costa, is a small dark brown spot: there is also a patch of dark brown on the middle of inner margin. Fringes white, with tufts of black scales on the middle of inner margin, at the angle of inner digit, and a smaller one between those two. In strongly-marked examples the tip of inner, and angle of outer, digits have black tufts also. The tip of the outer digit is pointed, but scarcely produced. Hind wings pale brown; fringes hardly paler, except those of third feather, which are white from the base to the tuft of black scales in the middle. Head and thorax same colour as fore wings. Abdominal junction paler.

LARVA.—Unknown to me. Wallengren says that it feeds in the stems of *Senecio nemorensis* (not a British plant); and Heinemans gives *Solidago virgaurea* as the food-plant. Plenty of this latter grew in the woods where the insect occurred in North Devon; therefore in this country we might expect to find the larvæ feeding on the latter plant.

It may be that I did not stumble across the head-quarters of this insect, and that the few examples I met with were stragglers;

but they were certainly in very fine condition, especially one female, which is so large and so strongly marked that I have, until just lately, considered it a distinct species. Comparison with a not very good continental type of *P. nemoralis* led to the error of supposing it to be an example of that species, as lately figured (Entom xiv. 304). When I state that the specimen measures rather over 14 lines in expanse, and that the largest of my other specimens—including several from Kent—does not exceed 11 lines, my former conclusion will not perhaps appear surprising.

AMBLYPTILIA, Hüb.
Tæniadactylus, Mihi.

IMAGO.—Expanse, 9½–10 lines. Fore wing, ground colour pale ochreous-brown, dusted with darker brown scales: a narrow dark chocolate line edges the costa, and a dark chocolate-brown stripe runs along the inner margin. This latter is interrupted or broken by three blotches, rather paler than the ground colour: one at the base, one in the middle, and one between this and the angle of inner digit. There are three conspicuous dark chocolate-brown marks: the first, somewhat triangular in shape, has its base on the costa just beyond the middle, and its apex in close proximity to the digital juncture; the inner half of this triangle is much darker than the costal half, and its posterior edge is distinctly edged with whitish, especially so on the costa. Beyond this the second and third marks represent a broadish fascia, interrupted by the fissure; its posterior edge is sharply defined by a whitish line running parallel with the hind margin. Fringes black, streaked along the inner margins with white. Tip of outer digit acutely pointed. Hind wings dark grey-brown, with only slightly paler fringes, except third feather, which has an elongate patch of black scales in the middle, and between this and the base of feather, whitish cilia. Head and thorax colour of fore wings. Abdominal juncture whitish.

Three fine examples of this "plume" occurred to me in a locality close to the sea in North Devon, where I have reason to believe that this insect has been taken before on two or three occasions, and exists in cabinets at the present time under the name of *Zetterstedtii*. This is the case in the Doubleday collection at the Bethnal Green Museum. It may be at once separated from the last-named species by its narrow wings, the structural character of which would seem to indicate its belonging to the subgenus *Amblyptilia*. The ground colour and markings certainly favour *Zetterstedtii*, but only superficially, for on comparison the dark brown digital fascia and black cilia sufficiently establish its claim to rank as a distinct species. I therefore propose for it the name *Tæniadactylus*, and its place in our collections is between *P. Zetterstedtii* and *A. acanthodactylus.*

OXYPTILUS, Zell.

Lætus, Zell.

IMAGO.—Expanse, 9 lines. Fore wing, ground colour whitish ochreous, more or less clouded with pale brown. The costa is narrowly edged with darker brown. The markings are few and inconspicuous. A black linear spot on the disk of wing always distinct, and at the digital juncture—which is nearly in the centre of the wing—are two small dark brown spots, and a faint white dash indicative of a line; and beyond this are two white lines running through the digits and their fringes. Tips of both digits sharply pointed, that of the inner deflexed. Fringes grey-brown, streaked with black and white, except along the middle of the inner margin, where they are whitish, with a small patch or two of black. Hind wings brown; fringes paler; a small tuft of black scales on the third feather beyond the middle, and a few white ones towards the base. Head and thorax colour of fore wings. Abdominal junction much paler.

The insect taken in Norfolk, and hitherto referred to this species, should be labelled *Distans*, Zell., in our cabinets. I was fortunate enough to meet with the true *Lætus* in North Devon during the last week in July, but only secured three specimens, although I put into practice every expedient known to me as usually successful in the capture of "plumes."

I understand from Mr. Meek that he has seen specimens from Kent, and, as far as I know, in that county and North Devon, are the only known British localities for *Lætus*, and at neither place has *Distans* been seen. On the other hand, in Norfolk, at the locality for *Distans*, *Lætus* does not appear to occur.

Oxyptilus distans, especially the continental type, is a broader-looking insect, and in colour much darker than *Lætus*. This darker ground colour throws up the whitish markings (which are nearly identical in form and position in both insects), consequently they appear rather more distinct. The black linear spot on the fore wing of *Lætus* shows up very distinctly. The smaller, more compact black tuft on third feather of hind wing, in conjunction with the marked difference of ground colour, constitute, I submit, trustworthy points of distinction between these two closely-allied species.

These comparisons are made from a series of examples of each species, including continental types. The latter were kindly given to me by Dr. Jordan, to whom I am also indebted for the privilege of examining his splendid collection of *Pterophori*.

I take this opportunity of thanking Dr. Jordan for the great courtesy shown me on the occasion of my visit to Edgbaston.

I believe North Devon would be found very rich in species of *Pterophoridæ*, if one's whole energies could be put into the work of hunting them up. Nearly all the specimens I got were taken in a casual manner, while collecting other species. Certain species of Macro-Lepidoptera were my particular quarry, but whilst searching for them I always had an eye for the "plumes."

Besides those species referred to in this paper I met with several others, about which I shall have something to say in an early number of this magazine.

12, Abbey Gardens, N.W., January 17, 1882.

A *COLEOPHORA* NEW TO BRITAIN.

By J. B. Hodgkinson.

I have to thank Mr. H. T. Stainton for kindly confirming my opinion as to the novelty of my species. He considers it very distinct, and most nearly allied to *C. badiipennella*, on account of having the distinct pale costal streak from the base of the costal cilia; but the ground colour of the wings is far glossier than in *C. badiipennella*.

Quite a dozen years ago, on a salt marsh beneath Humphrey Head, near Ulverston, I took a considerable number of this insect, and sent it away pretty freely as *C. salinella;* about three years ago I paid a visit with Mr. Threlfall to the same place, and a two days' hunt only yielded a score or so for each of us; since then I have made the acquaintance of the true *C. salinella*, which I find is a totally distinct species from mine. *C. salinella* being a larger insect and of a pale yellow colour, whereas the insect which I propose to name *C. adjunctella* is a shorter winged insect and of an olive-brown ground shade, it is clearly distinct from *cæspititiella* by the white streak that runs along the costa; also the wings are more arched, and in fine specimens there is almost an absence of streaks; the antennæ are much darker, nearly black, and more robust than in *C. cæspititiella*. The food of the larva has yet to be discovered; there were neither rushes nor *Luzula* about that I remember; we had to get them by creeping on our hands and knees, the place being too bare to sweep, and had to place our backs against the wind when we wanted to box any of the specimens.

15, Spring Bank, Preston, December, 1881.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

HESPERIA PANISCUS AND OTHER LEPIDOPTERA NEAR LINCOLN.—In a wood about seven or eight miles from Lincoln, while hunting for Coleoptera, on June 2nd last, I saw *Hesperia Paniscus* evidently not uncommon in one locality. On two subsequent occasions I visited the wood, but each time a thunderstorm, followed by heavy rain, came on just as we reached it, and stopped our operations; we, however, took one specimen each time, showing that it was still out, and I have no doubt that the insect was fairly plentiful. *Hesperia Tages* and one or two other "skippers" are also found in the same wood, as well as three or four species of *Argynnis*, and, above all, *Apatura Iris*, which I am told at some seasons may almost be called abundant in that locality. This is evidently not a rare species near Lincoln. One was captured this summer in the suburbs on a bed of Zinnia flowers in the garden of a friend of mine, and another was seen flying almost in the town. *Arge Galathea* is very abundant in a field near the wood above alluded to, and I took one specimen in a drive in the wood itself; the commonest butterfly seems to be *Satyrus Hyperanthus*. Mr. Baxter, taxidermist, of Lincoln, who kindly pointed out to me the locality, has shown me specimens of and given me notes about the following, as all taken by himself or his friend Mr. Meade in or near the same wood:—*Notodonta dictæoides*, not uncommon; *Notodonta dictæa*, rare; *Amphydasis prodromaria; Eurymene dolabraria; Ennomos erosaria* (this, I think, is a new locality for this insect); *Liparis monacha*, common; *Geometra papilionaria* (this is found in more than one locality in the neighbourhood); *Phorodesma bajularia*; *Scotosia undulata*; *Cidaria silaceata*; *Acronycta leporina*; *Aplecta herbida*; and many others. The wood has never been worked, except in a very desultory manner, and from what I have seen I believe that it would prove quite equal to many of the woods that are household words to entomologists, such as Darenth or Burnt Woods; moreover, it is entirely open to the public, and there is no interruption whatever from keepers. It may therefore seem strange that I have not mentioned the name and direction of the wood, but I have not done so on purpose. Mr. Baxter, above referred to, whose kindness in pointing out his particular localities is very rare, and hardly to be expected in a professional naturalist, showed the locality to some people, who did their best to exterminate *H. Paniscus* some time ago, and we do not wish for a like experience. Besides this, the wood is noted for its lilies of the valley, and when the wife of the holder was telling me the other day about the ravages of the public, who not only took the flowers, which they did not mind, but the bulbs as well, I could hardly help urging her to get the wood shut against all manner of collectors whatever. This damage and extermination of everything worth collecting and carrying away is a matter for the very serious consideration of entomologists, as through it nearly all the best collecting grounds are being gradually closed. Sherwood Forest, the paradise of midland entomologists, has nearly gone the way of the rest: a man who walked the forest a year or two ago with a net, and took pheasants' eggs instead of butterflies, has nearly put the finishing touch to the exasperation of the keepers. I think that all of us who are interested in the study of Entomology should once and for all continue to stop ravages and damage of all kinds whenever we may come across them—for although, as in the case mentioned above, it may be a pseudo-entomologist who causes the odium, yet in many cases collectors themselves are to blame for their utter disregard of everything except their own pursuit. With regard to extermination, it seems almost a pity that we cannot have some law to protect our more conspicuous indigenous insects, as well as our indigenous birds. One or two species either have disappeared, or are disappearing, owing to drainage and other causes, over which we have no control; but insects such as *Hesperia Actæon* and *Lycæna Arion* seem in a fair way towards extinction, simply owing to the mere greed of collectors. If they would only follow the valuable suggestion of Mr. M'Rae, in last month's 'Entomologist,' and let the worn females go, they might keep good series, and yet not lessen the number of specimens. I need hardly say that I shall have much pleasure in pointing out the exact locality of the wood referred to, to anyone really interested in Entomology who would like to work it.—(Rev.) W. W. Fowler; Lincoln, November 8, 1881.

Zygæna filipendulæ, variety.—During a visit to Wyre Forest, on July 3rd last, I captured a remarkable variety of *Z. filipendulæ*. The fore wings are of the usual dark green, the spots being black; the hind wings are black, with a dark green margin. The insect measures 1 inch 2 lines, and the spots are rather small.—J. E. Nowers; Burton-on-Trent, Dec. 7, 1881.

Sphinx convolvuli in Scotland.—I received from my brother, who resides in Kirkcudbrightshire, a male specimen of *Sphinx convolvuli*. He states having captured it on the evening of September 23rd in the window of an adjoining house. It was received by me alive, but in poor condition.—D. Macadam Haltwhistle; Northumberland.

Sphinx convolvuli in Scotland.—A fine specimen of this moth was taken about the middle of September in a grocer's shop in Dalbeatie. It is now in my collection.—J. J. Armistead; Douglas Hall.

Sphinx convolvuli in the Scilly Isles.—During a visit to the Scilly Islands this summer, I went to the island of Tresco (where the governor resides) for the purpose of seeing the almost tropical vegetation of Mr. Smith's (the governor's) grounds, and it certainly was very extraordinary to see growing in the open, at such a short distance from England, the wonderful variety of trees and plants; for instance, pepper trees in fruit, large camphor trees, cinnamon trees, huge aloes (twenty-eight being in bloom at the time of my visit), bamboos (I should say twelve to fourteen feet high), and several species of *Eucalyptus*. The gardener pointed out one which he said was the largest specimen of *Eucalyptus globulus* in Europe. Any quantity of Cacti and plants too numerous to mention. On September 8th I was much pleased by the head gardener bringing me alive a fine specimen of *Sphinx convolvuli* that he had captured that morning. He said that it was the first he had seen or heard of being taken in these islands. I should like to know, as I may possibly visit this island (Tresco), St. Mary's, and others again, whether this growth of almost tropical vegetation has any appreciable effect on the insect life, and also whether there are any published records of entomological work done in the Scilly Isles. The few insects I met with can be got a few miles from London, but as I took no apparatus with me this does not count for much.—ARTHUR BLASS; 43, Lothbury, London, November 21, 1881.

[Consult the Rev. H. Harpur Crewe's paper, "Entomology at Tresco and the Scilly Isles" (Entom. x. 295–7; December, 1877), in which we read, "*Sphinx convolvuli* was common hovering over various flowers at dusk, but the specimens were all more or less battered." In Francis Walker's "Notes on the Insects of the Scilly Isles" (Entom. vi. 3, 52, 78), species of all orders but Lepidoptera and Coleoptera are referred to, and a detailed list of the Diptera and Hymenoptera (especially the *Chalcididæ*) captured, is given.—E. A. F.]

EULEPIA GRAMMICA.—This day I have had the pleasure to pin in my cabinet a veritable British specimen of *Eulepia grammica*. About two months ago I went over to Keighley, in Yorkshire, to see an old man that my late friend T. H. Allis used to call upon. His name is Jesse Miller, one of the older stamp of collectors, who collected for love; and, unless Labgry or Allis called, he had no correspondents, still less with any dealers. Allis tried hard to get the *Grammica*, but Jesse stuck to the moth. I asked him who took it, and he told me it fell off a tree-branch whilst "shakking boo's"—that is, shaking the boughs of trees for caterpillars. I now copy from his letter to-day:—"I send the moth you want, with thanks. It was taken in Wharfdale, about forty-six years ago, by a person of the name of John Armstrong, living at Addingham Low Mill, five miles from Keighley. You need have no fear of its being British, and it is the only one of the kind I ever saw." I may add that the specimen is old and perfect, but badly set, and much smaller and duller looking than any foreign specimen I have seen. It is a male.—J. B. HODGKINSON; 15, Spring Bank, Preston.

ABNORMAL APPEARANCE OF NOLA CENTONALIS.—During the month of October, 1881, I bred a beautiful and varied series of *Nola centonalis*, and after trying several pairs at length succeeded in getting a very small batch of fertile eggs. I hardly expected to rear them at that abnormal season. The clover flowers were over, so on hatching I gave the larvæ the leaves of *Medicago lupulina*, on which they fed up pretty freely, and five of them spun up by December 16th, 1881. The first imago appeared to-day, January 23rd, 1882. The remainder of the brood I purposely checked by placing them in the out-door breeding house.—W. H. TUGWELL; Greenwich, January 23, 1882.

HYRIA AURORARIA BRED.—During August last a friend very kindly sent me a worn female of the above species, with five eggs deposited in the box. In due course these eggs hatched; the young larvæ fed well upon knotgrass, and after a short time three of them showed signs of changing into the pupa state. This they did, and at the latter part of October I was pleased to see three imagos emerge of this beautiful insect. Is it not rather unusual for a double-brood of this species?—J. R. WELLMAN; 219, Elm Park, Brixton Rise, S.W., November 16, 1881.

PHIGALIA PILOSARIA.—On the evening of January 15th I captured a fine male specimen of *Phigalia pilosaria* in a most unlikely place. I found the insect on the hedge in Haxby Road, but a few yards from where I live; and it seems remarkable how it came to be there, as I know of no oak trees, where the larva would have fed, within a mile or more of where I took it. The very early appearance this year of *P. pilosaria* is interesting, as the first I saw last year was on March 20th.—SAMUEL WALKER; 8, Neville Street, Haxby Road, York, January 17, 1882.

EUPITHECIA HELVETICARIA.—I recently received some pupæ of *E. helveticaria* from larvæ collected on the Pentland Hills. From them, although kept in a cold room, I found one emerged on Christmas Day, and another to-day. Several other pupæ have changed colour, so that I expect others out in a short time. I have not had the species for some twenty years, when they came out of pupæ at intervals, from December 23rd to April 7th. These were also in a cold, earthenware jar.—E. G. MEEK; 56, Brompton Road, S.W., January 5, 1882.

[illegible] was not aware that this species was [illegible] of July. I received from [illegible] hatched in due course. The [illegible] them until they [illegible] state. [illegible]

[illegible]

[illegible] — I. W[illegible]

[illegible]

been an assiduous attendant all through the season at the nocturnal assemblages on ivy, though with but indifferent success. I have found *Miselia oxyacanthæ* and *Cerastis vaccinii* in greatest profusion, and I have taken a fair number of *Orthosia lota* and *O. macilenta*, together with some individual specimens of *Xylina rhizolitha*, *Scopelosoma satellitia*, *Phlogophora meticulosa*, *Xanthia ferruginea*, *Anchocelis pistacina;* and of Geometræ, *Cidaria miata*, *Oporabia dilutata*, and *Cheimatobia brumata.* The moth which has most persistently refused to appear in anything like fair condition is *O. macilenta*, and *X. ferruginea* has been almost equally refractory. I can imagine no means of collecting so exciting as that afforded by ivy; there is not the trouble and discomfort, to my mind, always more or less accessory to sugaring. A sticky-pot, a brush with its handle drenched in treacle and rum, everything about you more or less sticky, and after all this the chance of no sport. Of course you may get nothing, and constantly do get nothing on ivy, but you do not feel so justly aggrieved in the case of ivy as in that of sugar. A small pair of steps, a lantern, and a store of glass-top boxes, and you are ready. Eagerly you scan the ivy blossoms. With regard to weather, I have found the most productive nights to be misty and dark, with a slight breeze. It is positively useless to examine ivy on moonlight nights, at least I have found it so. I do not know whether any real reason is assigned why ivy blossom should be so fatally attractive to moths; is it the irresistible influence of intoxication? I shall be glad to see in your interesting columns any explanation or reason as a solution why ivy should prove so manifest an attraction to the insect world.—C. W. Lubbock; Leesons, Chislehnrst, November, 1881.

Lepidoptera at Ivy.—Although an observer of insects for many years I never caught a moth at ivy-bloom till the middle of this month (November, 1881). The fine mild weather has tempted me to go, lantern in hand, during the last few nights; and although I have been able to spare but very little time my success has been very gratifying to me. I have caught, amongst others, the following:—*Xylina semibrunnea*, *X. petrificata*, *X. rhizolitha*, *Orthosia lota*, *Scopelosoma satellitia*, *Cidaria Psittacata*, *Phlogophora meticulosa.*—W. Macmillan; Castle Cary, Somerset, Nov., 1881.

Cerostoma asperella.—It is with pleasure I record the capture, in September last, of the above rare and lovely Tineina in its old haunt in this county. The last specimen seen here was in September, 1868, although the locality has been yearly worked.—[Mrs.] E. S. HUTCHINSON; Grantsfield, Leominster, Herefordshire.

DESCRIPTION OF THE LARVA OF PTEROPHORUS PTERODACTYLUS, *Linn.* (FUSCODACTYLUS, *Haw.*).—On the 13th of June last, Mr. W. H. B. Fletcher found, feeding on speedwell growing on a bank at Worthing, a good supply of larvæ of this species, which he at once kindly forwarded to me. It was, however, a late batch, for at the time Mr. Fletcher was breeding the moth freely from larvæ he had collected some weeks previously. Length about five-eighths of an inch, and scarcely so stout as seems usual in the genus. Head small, and narrower than the second segment; it is polished, rather flat in front, but rounded at the sides. Body cylindrical, of fairly uniform width, but tapering a little at the extremities; segmental divisions well defined; the skin, with a soft and half-transparent appearance, is sparingly clothed with short hairs. There are two varieties, which are perhaps about equally numerous. In one of them the ground colour is a bright grass-green; in the other it is equally bright yellow-green; in both forms the head is pale yellowish brown, very prettily reticulated with intense black. The dark green, or in some of the yellow specimens dark brown, alimentary canal forms the dorsal stripe; subdorsal lines rather indistinct, grayish white; below there is a still more indistinct waved line of the same colour; there is, again, a similarly coloured faint line along the spiracular region; and the segmental divisions also are of this pale colour. In some specimens the hairs are gray; in others brown. Ventral surface uniformly of the same colour as the ground of the dorsal area: the legs reticulated, and the prolegs tipped, with black. The pupa is attached by the tail only, is rather long, but slender. The head, which is the thickest part, is abruptly rounded, and has the snout very prominent; thorax and abdomen rounded above, rather flattened beneath, and attenuated strongly to the anal point; eye-, leg-, and wing-cases fairly prominent, the last prolonged a considerable distance over the abdominal segments. As in the larva, there are two varieties; in one form the ground is bright green, and there is little of any other colour, the pale gray abdominal divisions, and two indistinct pale lines on the dorsal area, with several faint purplish spots behind the thorax and on the anal segment, being all that are noticeable. The other form has the ground a dingier green, and there is a distinct purple dorsal stripe, edged on each side with grayish; the abdominal divisions and the tip of the prolonged wing-cases also purple. The pupa is capable of considerable movement, and, on being disturbed, turns up sharply the thorax and higher abdominal segments, so as to bring them quite at right angles with the several posterior segments. The first imago emerged on June 29th, and was quickly followed by a good series, which varied in size very much, some specimens being quite small. Two species of parasites also emerged, one of them an ichneumon with a long ovipositor, which Mr. Bridgman informs me seems new to Science.—GEO. T. PORRITT; Highroyd House, Huddersfield, January 2, 1882.

PEZOMACHI IN DEVON.—It may be interesting to some fellow-workers at the Parasitic Hymenoptera to notify a few captures of *Pezomachi* during the past year. *Pezomachus carnifex* I obtained by beating a whitethorn hedge at Exminster on the 3rd September, and again at Bickleigh on the 16th September. *P. rufulus* was common at Bickleigh on the 16th September. *P. corruptor.*—A single specimen, on the 20th August, at Bickleigh. *P. insidiosus.*—A single example, on the 6th September, at Bickleigh. *P. intermedius* and *P. incertus* were beaten out of a whitethorn hedge at Exminster, on the 3rd September: these two and the two following were recorded as British, in a paper read by Mr. Bridgman, before the Entomological Society of London, on the 6th April last. *P. Mülleri.*—A single specimen, on the 6th September, at Bickleigh. *P. nigritus.*—This I received from Liverpool from Mr. C. H. H. Walker, who bred it from galls formed on *Hieracium umbellatum;* without doubt it is parasitic on *Aulax hieracii*, the gall-maker. *P. oxylochophilus.*—This and the next species are now recorded for the first time as new to Britain. I obtained this species by beating whitethorn at Exminster, on the 3rd September. Mr. Bridgman has taken it at Norwich this year. *P. analis.*—This has also been taken by him for some time past, but not recorded from the difficulty of identification; it did not fall under my beating-stick until the 6th September last, and then at Bickleigh. *Hemimachus fasciatus* I obtained at Exminster on the 3rd September, and at Bickleigh on the 6th. *H. instabilis*, Först (*rufocinctus*, Gr.).—A single example, on the 16th September, at Bickleigh. Mr. Bridgman very kindly named the species of this most difficult group for me, the difficulty arising from the great variation in size and colour. —G. C. Bignell; Stonehouse, Devon, December 22, 1881.

[The handsome *Pezomachus oxylochophilus* has been taken by Mr. J. W. May, near the Raynes Park Station, Wimbledon, in September, 1878; by Mr. T. R. Billups, at Rainham, Essex, on July 11th, 1881; and by Mr. Bridgman, at Blundall, near Norwich.— E. A. F.]

Plagiodera armoraciæ, *L.*—I observe in the January number of the 'Entomologist' (Entom. xv. 23) that Mr. Theodore Wood, after referring to my letter, says that this beetle "may, possibly, be often passed over as the common *Phædon cochleariæ*." I can hardly think that this is the case, as Mr. G. C. Champion, who would be very unlikely to make such a mistake, considered *P. armoraciæ* far from common; indeed he found very few. Those who have once seen *P. armoraciæ* gleaming under the bark of the willow would not confound it with any other beetle. I have never secured very many at one time; in fact, during the whole of one season I took but three; they were, however, more abundant this season. I rather agree with the Rev. W. W. Fowler's remarks as to the rarity of *Plagiodera*, in his paper on the genus *Phædon;* as, judging from the number of coleopterists who have been supplied with series from my captures, it would appear that, if not scarce, it is an extremely local insect. I have searched the willows in many places, but, with the exception of the one locality in Surrey from which I procure it, I have been unable to discover any traces of it.—G. A. Lewcock; 40, Oxford Road, Islington, N., January 14, 1882.

Description of the Larva of Lina longicollis.—At Abbot's Wood, near Eastbourne, in Sussex, I saw large numbers of this insect, the larvæ of which had devastated many of the young trees, eating the leaves completely to a skeleton condition. The following is a description of them:—White, with a blackish line in the centre, from the 3rd segment, becoming indistinct and interrupted after the 9th. On the 3rd and 4th segments are three black spots in the form of a triangle; on the 5th to 9th one larger spot on each side; on the 10th and 11th the spots coalesce; while the 12th and 13th are (on the upper side) entirely black. The 2nd segment is black margined with white, and with a faint whitish line and depression in the centre. Head and legs black; sides and under side white with black spots, the upper row of which forms protuberances. Length, 5 lines. The pupa is brownish yellow, marked much like the larva, and is suspended from the under side of the leaf.—T. L. PENNELL; 14, Upperton Gardens, Eastbourne.

NEW NATURAL HISTORY SOCIETY.—Under the title of "North Middlesex Natural History Association," a new Society devoted to the study of Natural History, and the somewhat extensive work of forming "a Natural History Museum and Library for Reference," has been formed. The circular is dated from a temporary address in Holloway, so we may conclude that the more active efforts of its members to establish these institutions will be made in that neighbourhood of North Middlesex. We suppose in this great metropolis, with its four millons of people, there is plenty of room for many more new societies devoted to the same subject; but we imagine it might be better to concentrate our energies a little more on those already established, some of which would bear a little more organisation and development. —ED.

NOTICE OF MAGAZINE.

The 'Union Jack Naturalist.' Edited by C. E. KENNEDY, Liscard Park, Birkenhead, 1881–2.

THIS small magazine, which is devoted to all branches of Natural History, has reached its third number. It has been established chiefly as a reporter for the Union Jack Field Club, which, on enquiry, we find has some 220 branches, with an aggregate of 3000 members, composed principally of boys and young men. Beyond reports of meetings of the branches of this club, and other societies, are occasional articles, evidently written for young people or beginners in the study of natural-history field-work. This will be found a useful magazine for these young people, and will, doubtless, foster a desire amongst its readers for further knowledge on the subject. We wish Mr. Kennedy (who, by the way, introduces himself, on the cover of No. 1, as a "M.U.J.F.C.") every success with his little venture.—J. T. C.

NOTES FROM CURRENT ENTOMOLOGICAL LITERATURE.

Economic Entomology.—The 'American Naturalist' for January, 1882, contains, amongst the usual entomological notes edited by Professor C. V. Riley, an announcement that a State Congress of entomologists and fruit-growers was to be held in the senate-chamber, Sacramento, 6th and 7th December last, for the purpose of consultation and discussion as to the most practical means of exterminating the insect pests now infesting the orchards and gardens of the State of California.

In the London 'Standard' of January, 18th appeared a leading article upon Miss Ormerod's work and report relative to the economic entomology of this country. This has been followed by several letters on the subject. Other London and provincial papers have also drawn the public attention to Miss Ormerod's work. Are we to have a State entomologist after all?

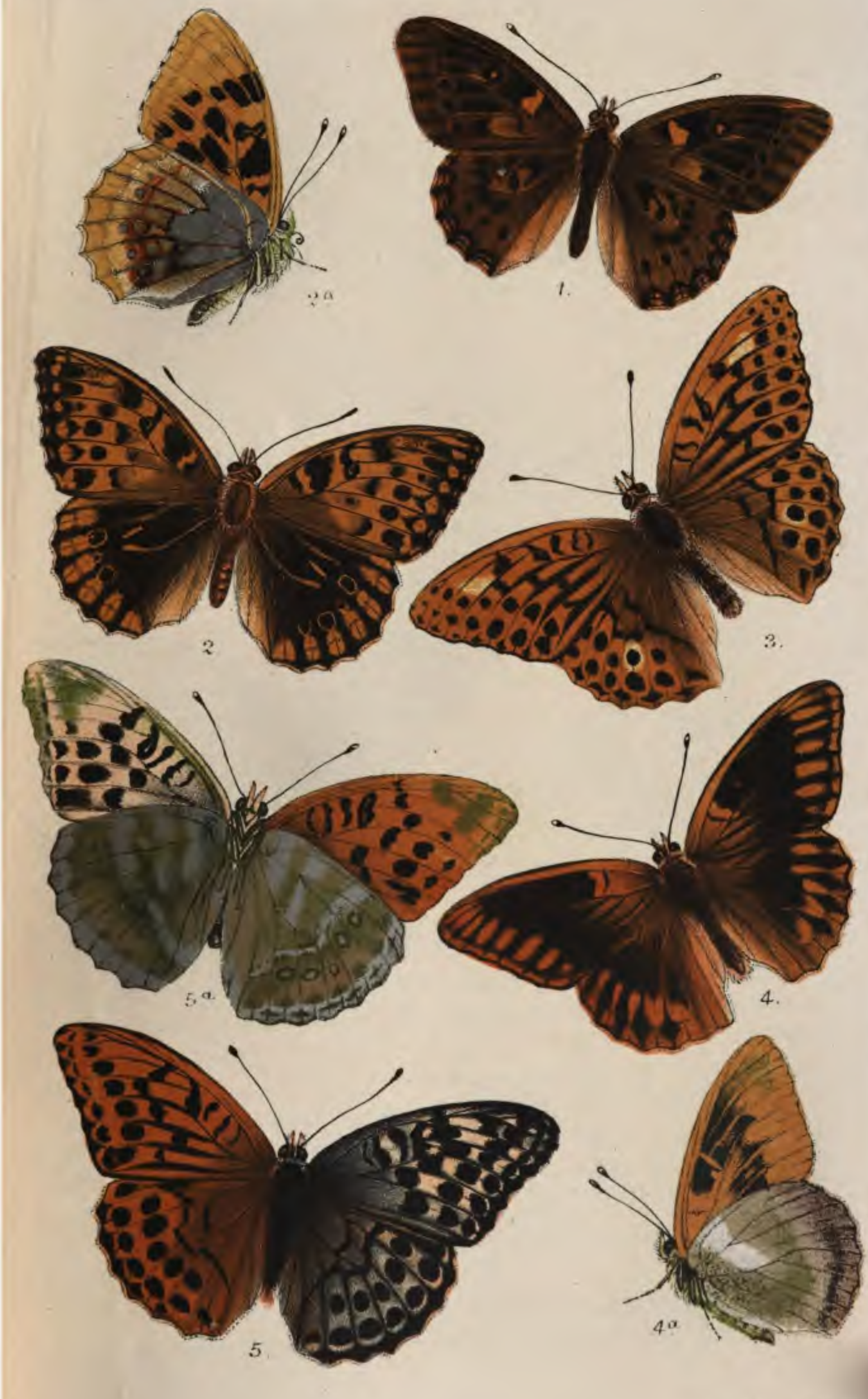
The Neuroptera of Madeira and the Canary Islands.—In the current journal of the Linnean Society appears a paper by Mr. Robert M'Lachlan, F.R.S., which forms an interesting contribution to the study of island life. Although the Coleoptera has been carefully studied by the late Messrs. Wollaston, Crotch and others, little systematic work had been hitherto done towards elucidating the natural history of the Neuroptera of those islands. The bases of this paper was a collection of Neuroptera, taken by the Rev. H. E. Eaton during the winter of 1880–1881. His stay in such of the islands visited by him was, however, of short duration. Madeira having but fourteen days devoted to it during the unfavourable month of November, nevertheless yielded twenty species, several of which were previously unknown. Six days in the Grand Canary, and one day only in the island of Palma, resulted during December in the capture of some eighteen species in that group of islands. Added to these the author finds in scattered papers references to other species. An analysis of all yet recorded shows "that 53 species are known from these islands; 37 are found in Madeira and 31 in the Canaries, 16 being common to both. Of these 53 species, 19 are known inhabitants of the continent of Europe and 5 others are doubtful in this respect, owing to imperfect identification. Four *Odonata* are African species not known to occur in Europe." Twenty-five species or thereabouts seem to be peculiar to the islands.

After some further remarks upon the probability of certain other genera being ultimately found in those islands, the author concludes by describing in detail the new species, and referring to those already known to Science.

J. T. C.

Entomologist. March 1882.

Plate 1.



West Newman & Co. [illegible]

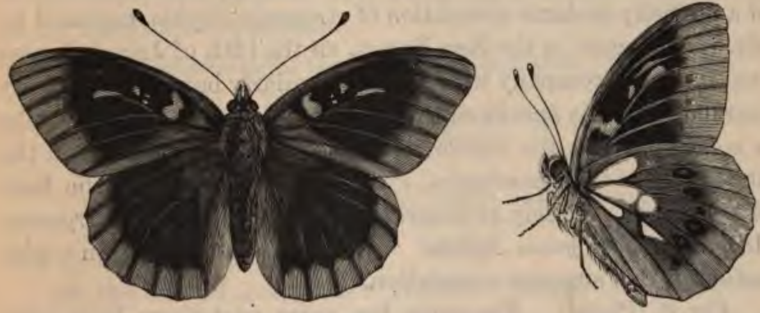
THE ENTOMOLOGIST.

Vol. XV.] MARCH, 1882. [No. 226.

ABERRATIONS IN THE GENUS *ARGYNNIS*.

By J. Jenner Weir, F.L.S., F.Z.S., &c.

(Plate I.)



Argynnis Adippe, *var.* of male.

The woodcut at the head of this article represents the upper and under sides of an aberration of *Argynnis Adippe* (male), captured near Salcombe, South Devon, last year, by Mr. A. W. Sture, of that town.

The specimen is a good example of partial melanism, accompanied by an almost total obliteration of markings; the red spot on the upper side, towards the base of the primaries, is very conspicuous. On the under side the silver spots towards the base of the secondaries are confluent, and those usually found in the middle and towards the edge of the wing are, with one exception, absent.

Fig. 1, Plate I., represents a partially-melanic aberration of *Argynnis Aglaia* (male), captured with another somewhat similar by Mr. P. H. Cooper, near Dover, about the middle of July, last year; the aberration is perfectly parallel on the upper side to that of *Argynnis Adippe* described above, even to the conspicuous red spot towards the base of the primaries.

Figs. 2 and 2 *a*, Plate I. In this aberration of *Argynnis Aglaia* (female) the melanism is almost confined to the upper side of the secondaries, but the under side of the same wings show—as in *Argynnis Adippe*, described above—an absence of silvery spots in the middle and margin of the wings, and at the base the spots become confluent in a silvery patch. The specimen was captured last year in the New Forest by Mr. Ashmede. I do not feel quite certain that the insect is not a hybrid between *Argynnis Aglaia* and *Argynnis Adippe;* the red spots on the under side of the secondaries are very much more apparent than usual in the former species.

Figs. 4 and 4 *a*, Plate I., represent the upper and under side of a partially-melanic aberration of *Argynnis Paphia*, captured by Mr. W. J. Argent in the New Forest, on the 12th of July, last year (see p. 52), in company with another similarly but not so strongly marked. In this specimen the partial melanism of all the wings is correlated with the obliteration of the silvery markings on the under side of the secondaries, except a pearly patch at the base of the wings, precisely as described above in the cases of *Argynnis Adippe* and *Argynnis Aglaia.* I am not able to offer an explanation of this singular correlation.

Fig. 3, Plate I. For some few years past there have been captured each season in the New Forest specimens of *Argynnis Paphia* (male) with a nearly white spot on each wing; that figured from the cabinet of Mr. Carrington was taken last year; I have taken four myself in 1879 and 1880, and in the same locality captured a similar aberration of *Argynnis Euphrosyne.* I feel quite unable to suggest any explanation of this singular aberration.

Figs. 5 and 5 *a*, Plate I., represent a specimen of *Argynnis Paphia*, both hermaphrodite and dimorphic, captured by Mr. Bernard Cooper in the New Forest on the 12th of July, last year; the left side is the normal form of the species in the male sex, and the right side is that of the dimorphic female coloration of the variety *Valezina.*

Whether there is any advantage to Nature derived from the existence of hermaphrodites it is impossible to say; but in the case of butterflies, where the male and female differ very much, they have often settled their specific identity, and still more in the case of dimorphism.

I have been an impatient listener to accounts of the quite different habits of *Argynnis Paphia* to those of *Argynnis Valezina*. In my younger days all seemed to think that the degradation of a so-called species into a variety was a positive injury to the value of a collection; but now a variety, local race, or even aberration of the commonest insect, is invested at once with both a scientific and an intrinsic value.

I trust I have written sufficient to show that some instruction may be gained from mere aberration, more from varieties, and still more from dimorphic forms; and, in conclusion, have to express my thanks to Messrs. Ashmede, Carrington, B. Cooper, J. H. Cooper, and Argent, for placing these valuable specimens in my hands for description.

6, Haddo Villas, Blackheath, London, S.E., February, 1882.

NOTES OF CAPTURES IN THE NEW FOREST.

By Wm. J. Argent.

At the risk of going over ground trodden by other correspondents in recent numbers of the 'Entomologist,' I venture to send a few notes of a fortnight's stay, made with my friend Mr. Bernard Cooper, at Lyndhurst, during the second and third weeks of July last. The weather, as many will remember, was hot and cloudless; being, in fact, one of those rare spells of real summer weather, with a heat almost tropical, and increasing every day in intensity, with which we are still occasionally favoured. For entomological purposes, at least, it was simply perfect; brilliant days being succeeded by nights equally acceptable to insect life.

As a result of the increased heat, nearly everything was a week or more in advance of its usual time of appearance. As early as the 13th the second brood of *Leucophasia Sinapis* was on the wing, and *Catocala promissa* made its first appearance at sugar; whilst a few days later *Gonepteryx Rhamni* was disporting itself among the hosts of *Limenitis Sibylla* and *Argynnis Paphia*, then past their prime.

Argnnnis Paphia was, as has been observed, somewhat unusually abundant, but the proportion of its variety *Valezina* was far greater than I had observed it on any previous occasion. It was no unusual thing to see a dozen in the course of a morning's walk, or to come upon two at rest within a few inches of each other on a bramble or fern leaf. The depth of colour varies considerably in different specimens, from intense black to a shade of brown almost intermediate between the variety and the typical female. I was interested to learn from Mr. Tate that an entomologist known to him, who had obtained eggs from a *Valezina*, reared, out of eleven larvæ which survived to enter the pupa state, five *Valezina;* the remaining six being three typical females and three males. Thus (in this case) about 45 per cent. of the surviving progeny of a *Valezina* proved to be *Valezina*.

The remarkable dimorphic form, figured on Plate I. (figs. 5 and 5 *a*), was taken by Mr. Bernard Cooper in Park Ground Enclosure on July 12th; and the dark suffused variety of the male (figs. 4 and 4 *a*) was taken by myself on the same day in Brick Kilns, together with another similarly, though not so strongly, marked. In addition to these, a form of the male was not uncommon having a pale straw-coloured wedge-shaped mark on each of the upper, and sometimes also on the lower wings; and we each took one having the greater part of the under wings bleached after the manner of some of the New Forest forms of *Satyrus janira*.

Limenitis Sibylla was almost equally abundant. One I took was almost black, having a faint tracing only of the usual white markings.

Apatura iris.—Of this noble insect we saw a fair number, and spent many hours watching their majestic flight along the topmost branches of the oaks and firs. A series each adorned our setting boards before we left; one, a female, being given to the writer by the good-natured hostess of the 'Rose and Crown' at Brockenhurst, having settled on an outer door of that hostelry in the morning.

Boarmia roboraria was still common on the fir trunks, but somewhat out of condition. The variety *Conversaria* of *B. repandata* was not uncommon, but getting likewise slightly worn.

osia quadra and *Liparis monacha* were common in the pupa state, but much affected by the attacks of ichneumons. The perfect insect of the former came freely to sugar, in company with hosts of *Leucania turca*, sundry *Triphæna fimbria*, and other commoners. *Cleora glabraria* larvæ had also been common. As is well known, most of the late ones are ichneumoned, but we took sufficient to breed a good series.

Triphæna subsequa.—Of this we took some four or five at sugar. It is easily distinguishable from *T. orbona* by the spot on the costa, by the size of the discoidal spots (which are larger and more distinct than in *Orbona*), and by its general appearance when at rest on the trees.

The principal excitement of the evening during the last few days of our stay was caused by the appearance in some numbers of those two handsome insects, *Catocala promissa* and *C. sponsa*. The first, *C. promissa*, appeared on the 13th July, and the species gradually increased in numbers from that time. *C. sponsa* came on the 19th, and was fully out by the 22nd, on which evening we boxed without difficulty some forty without the aid of a lantern; indeed by the time it was dark enough to light up, both "crimsons" had disappeared, and the tree trunks were almost deserted.

In the foregoing sketch I have referred only to the most noticeable species taken by us during one of the pleasantest of many holidays spent in the New Forest.

Wanstead, November 1, 1881.

OBSERVATIONS ON THE HABITS OF ANTS.*

By Sir John Lubbock, Bart., M.P., F.R.S., Pres. Linn. Soc.

Identification of Companions.

With reference to the interesting problem as to how ants recognize their companions, I have tried the following little experiment. It is of course well known, and has been abundantly proved by my experiments, that although if a strange ant is introduced into a community even of the same species, she is at once attacked. On the other hand, if a few ants belonging to different communities are placed together in a confined space, though at first a little shy, they gradually make friends. I thought, therefore, I would take a few specimens of *Formica fusca* from two different nests, which we will call nests A and B, place them together, and then, when they had lived together for some time, introduce the ants from nest A into nest B, and *vice versâ*. Accordingly, having first ascertained by direct experiment, though I had myself no doubt on the point, that the ants in nest A would attack and expel an ant from nest B, and *vice versâ*, I took two ants from nest A on the 2nd December, 1880, and put them in a small glass with two others from nest B.

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* Further Abstract of a Paper read before the Linnean Society, November 17th, 1881, continued (Entom. xiv. 282).

Then on the 23rd January, I put two of the ants from nest A into nest B. One of them was at once attacked; about the other we could not be sure. Unluckily the two ants from nest B were killed by an accident.

On February 24th, 1881, I again took three ants from nest A and the same number from nest B, and put them together in a small glass. Then on May 1st I put two ants from nest B into nest A. They were soon attacked very vigorously, and dragged out of the nest.

Thus, then, though these ants had lived amicably for some weeks with companions from another nest, they were not accepted as friends by the nest from which those companions were taken.

In consequence of Mr. M'Cook's suggestion, I took three specimens of *Lasius niger* and three of *Formica fusca*, and put them in water for an hour. After marking them, I put them back in the nest. The specimens of *L. niger* were put back at 11 a.m. They were quite amicably received, and the other ants began at once to lick off the paint with which they were marked. At 11.30 one was among the rest, evidently quite at home; the other I could not distinguish; but no ant was being attacked. At 12 the one was not quite cleaned; the other I could not distinguish. I looked from time to time during the afternoon, and certainly there was no fighting in the nest. The next morning I looked carefully, but there was no dead body, and I am satisfied they were amicably received.

The following morning at 7 a.m. I put in the three specimens of *F. fusca*. They were also evidently received as friends, and their companions began, as in the other case, to clean off the paint At 7.30 they were quite at home among the others. 8, ditto. 9 10, ditto. There could be no doubt about their recognition

ON ANERGATES.

The life-history of the genus *Anergates* is, in the words of Forel, an unsolved enigma. The species was discovered by Schenck, who found a small community consisting of males, females, and workers, which he naturally supposed belonged to one species. Mayr, however, pointed out[*] that the workers were in fact workers of *Tetramorium cæspitum;* and it would appear that, while in *Strongylognathus* the workers are comparatively few, *Anergates* differs from all other ants in having no workers at all.[†] The males and females live with *Tetramorium cæspitum*, and are in several respects very peculiar—for instance, the male is wingless. One might consider it rather a case of parasitism than of slavery, but the difficulty is that in these mixed nests there are no males and females of *Tetramorium*. It seems quite clear that *Anergates* cannot procure its slaves, if such they are, by marauding expeditions like those of *Polyergus*, in the first place because they are too few, and secondly because they are too weak. The whole question is rendered still more difficult by the fact that neither Von Hagen[‡] nor Forel found either larvæ or pupæ of *Tetramorium* in the mixed nests. The community consisted of males and females of *Anergates*, accompanied and tended by workers of *Tetramorium cæspitum*. The *Anergates* are absolutely dependent upon their slaves, and cannot even feed themselves. The whole problem is most puzzling and interesting. On the whole I would venture to suggest that the female *Anergates* makes her way into a nest of *Tetramorium* and in some manner contrives to assassinate their queen. It must be admitted that even this hypothesis does not fully account for the facts. Still, I have shown that a nest of ants may continue even in captivity for five years without a queen. If, therefore, the female of *Anergates* could by violence or poison destroy the queen of the *Tetramoriums*, we should in the following year have a community composed in the manner described by Von Hagen and Forel. This would naturally not have suggested itself to them, because if the life of an ant has, as was formerly supposed, been confined to a single season, it would of course have been out of the question; but as we now know that the life of ants is so much more prolonged than had been supposed, it is at least not an impossibility.

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[*] Europ. Formic.

[†] In *Tomognathus sublævis*, on the contrary, a Finland species, which lives in the nests of *Leptothorax muscorum and L. acervorum*, the workers only are known.

[‡] Verh. des Natur. Vereins der preuss. Rheinlande und Westphalens. 1867, p. 53.

At any rate the four genera of so-called slave-making ants offer us every gradation from lawless violence to contemptible parasitism. *Formica sanguinea*, which may be assumed to have comparatively recently taken to slave-making, has not as yet been materially affected.

Polyergus, on the contrary, already illustrates the lowering tendency of slavery. They have lost their knowledge of art, their natural affection for their young, and even their instinct of feeding! They are, however, bold and powerful marauders.

In *Strongylognathus*, however, the enervating influence of slavery has gone further, and told even on the bodily strength. They are no longer able to capture their slaves in fair and open warfare. Still they retain a semblance of authority, and, when roused, will fight bravely, though in vain.

In *Anergates*, finally, we come to the last scene of this sad history. We may safely conclude that in distant times their ancestors lived, as so many ants do now, partly by hunting, partly on honey; that by degrees they becmae bold marauders, and gradually took to keeping slaves; that for a time they maintained their strength and agility, though losing by degrees their real independence, their arts, and even many of their instincts; that gradually even their bodily force dwindled away under the enervating influences to which they had subjected themselves, until they sank to their present degraded condition—weak in body and mind, few in numbers, and apparently nearly extinct,—the miserable representatives of far superior ancestors, maintaining a precarious existence as contemptible parasites of their former slaves.

It is conceivable that the *Tetramoriums* may have gradually become hardier and stronger; the marauding expeditions would then become less and less frequent. If, then, we suppose that the females found it possible to establish themselves in nests of *Tetramorium*, the present state of things would almost inevitably be by degrees established.

Thus we may explain the remarkable condition of *Strongylognathus*, armed with weapons which it is too weak to use, and endowed with instincts which it cannot exercise.

(To be continued.)

CHEIMATOBIA MYRICARIA, MIHI.

A GEOMETER NEW TO SCIENCE.

BY NICHOLAS COOKE.

ON the 27th January last I received from Mr. James Edmondson, of Keswick, three living pairs of a *Cheimatobia* which he informed me had just emerged from pupæ, and that he found the larvæ last summer, spun up in the leaves of sweet gale (*Myrica gale*).

The species is so much like *C. brumata* that I entertained some doubt about it being a distinct species; but he yesterday visited the spot where he found the larvæ, and captured five males (two just emerged) and one female on grass and posts near the sweet gale. I think this conclusively proves that the moth is quite distinct from *C. brumata*, as that species must have been quite over for a full month. I suggested that the warmth of the room in which the pupæ had been kept (there having been a fire in it most days since last August) had delayed their appearance, if they were *C. brumata*, as it was possible they had been waiting for cold weather; but he tells me he bred *C. brumata* in the same room, and that they emerged on the 5th November.

Dr. Staudinger gives only two species in the genus, so that it must be new to Science. I therefore propose the name *Cheimatobia myricaria.* The following is a description of—

Cheimatobia myricaria, mihi.

Expanse of wings fifteen-sixteenths to one inch and one-eighth. Fore wings brown, tending to purple, with several wavy darker transverse lines, and a darker central band; in some specimens the ciliæ are spotted with dark brown at the ends of the nervures. No central spot. The nervure in the middle of the wing forms a dark line where it passes through the dark band. Hind wings pale, with darker ciliæ. It is rougher looking than its nearest ally, *Cheimatobia brumata*, and rather smaller. The difference in colour between the two species is more striking on the under side. The female has the rudimentary wings grey, shorter than *C. brumata*, and in some cases without the dark band; its place in others indicated by a dark spot on each edge of the wing.

Larva on *Myrica gale;* makes its cocoon with grains of sand on the surface of the ground. Imago appears at the end of January.

Gorsey Hey, Liscard, near Birkenhead, February 8, 1882.

[I have not seen specimens of the moths referred to by Mr. Cooke, so cannot offer an opinion as to their distinctness; but *Cheimatobia brumata* has been observed in the Kentish woods at intervals during this abnormally mild winter, from October until the present time (February 20th), by my friend Mr. A. B. Farn. —J. T. C.]

THE TORTRICES OF NORTH DEVON.

By Richard South.

As addenda to my papers on collecting in North Devon, I will give a list of Tortrices met with in that locality last season:—

Halias prasinana was common in woods, flying just at dusk about the higher branches of oaks. I had never noticed before the peculiar buzzing noise made by this insect when flying, but I think I have previously heard of this stridulation. *Sarrothripa revayana*, a number bred from larva beaten out of oak. *Tortrix podana, T. sorbiana*, and *T. icterana;* the two former flying around oaks just before dusk or beaten out of ivy, and the latter flying along the rocks where the larvæ feed on the leaves of almost every plant growing thereon. In Middlesex and elsewhere, I have found this species in meadows, but in North Devon it seemed confined to the rocks; I did not observe a specimen in any stage in any of the fields or meadows. *T. Fosterana* was often beaten out of ivy, but *T. sylvestrana, T. roseana, T. heparana, T. unifasciana, T. viburnana, T. viridana*, and *T. ministrana* were met with but sparingly: this is curious, especially with regard to *T. viridana.* I was always under the impression that this insect was a pest everywhere in England.

Leptogramma literana, a number bred from larvæ beaten out of oaks. Among them were the forms *Romanana*, Fab.; *Asperana*, W. V.; *Irrorana*, Steph.; *Tricolorana*, Steph.; *Fulvomixtana*, Steph.; and a variety or two distinct from either of the known forms.

Dictyopteryx Lœflingiana, D. Bergmanniana and *D. Forskaleana, Argyrotoza Conwayana, Ptycholoma Lecheana, Penthina pruniana* were all scarce, but *Penthina cynosbana* was very common in every hedge. *Spilonota ocellana* was also fairly common, but I only obtained one example of *S. lariciana* among larch. *S. dealbana, S. neglectana, S. suffusana*, and *Pardia tripunctana* were only occasionally met with. *Sericoris littoralis* was common among its food-plant, *Statice armeria*; and *S. lacunana*, var., often captured in a wood close to the sea, but, strange to say, the ordinary form of the species did not occur in that wood, nor anywhere near, so far as I am aware, though *S. urticana* was abundant.

Cnephasia musculana and *Capua favillaceana* were both common; the last-named beaten out of heather in oak woods during the day, or found setting on tops of the same plants at night, after its short evening flight was over. This flight commenced about an hour before dusk, and continued until quite dark. *Phoxopteryx unguicana* sometimes met with on heaths, *P. uncana* was found in every wood where bilberry grew, and *P. Mitterbacheriana* occurred among oaks.

Grapholitha nigromaculana among ragwort, *G. campoliliana* among sallow, and *G. geminana* among bilberry, were all fairly common. *Hypermecia augustana* and *H. cruciana* occurred frequently among sallows. *Pœdisca corticana* was abundant; simply jarring an oak trunk with the foot would bring down a regular shower of *corticana*, with now and then *P. profundana*. *P. occultana* was met with in a larch plantation, and was fairly common.

Ephippiphora Pflugiana and *E. Brunnichiana* were plentiful. *E. turbidana*: the capture of this insect has already been mentioned (Entom. vol. xiv., p. 156). Three specimens of *E. tetragonana* and one solitary example of *E. obscurana* were met with; the last-named beaten out of oak into an umbrella, and boxed before he had realised his position. *Olindia ulmana* was captured now and then, usually met with in lanes.

Dicrorampha alpinana. The *Dicrorampha* referred to in Entom. vol. xiv., p. 159, must for the present stand as a local form of *alpinana*; I hope to be able to find the larva some day, and shall be greatly surprised if it does not exhibit some point of distinction when compared with the known larva of *alpinana*. I sent a specimen of the insect to Mr. C. G. Barrett, and he considered it a "very fine and strongly-marked *alpinana*." There is [illegible] [illegible] [illegible] I [illegible] [illegible] the [illegible], and of [illegible] [illegible] [illegible] to Mr. [illegible] [illegible] [illegible]:—"I am [illegible] [illegible] [illegible] [illegible] [illegible] although [illegible] [illegible] [illegible], [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] . . . . and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]." So it would appear that [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] itself [illegible] [illegible] particular species of [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] to allied species of [illegible] [illegible] [illegible] to allied genera, though after all there is not much difference in the proportions of *Larentia*, [illegible], and [illegible], each being more or less [illegible] [illegible] all [illegible] *D.* [illegible], *D.* *[illegible]* and *D.* [illegible] [illegible] [illegible]. The new *[illegible]* figured in last year's volume will shortly be described.

[illegible] [illegible] was sometimes captured in a garden, at rest on [illegible] in the sunshine.

[illegible] [illegible] [illegible] few in woods. *Eupithecia* [illegible], *E.* *[illegible]*, *E.* *[illegible]* and *E.* [illegible] were met with, but not commonly.

[illegible] *[illegible]* and *[illegible]* [illegible] were common; so also were *[illegible]* [illegible] and *[illegible]* [illegible].

[illegible]

[illegible] LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. I.—INTRODUCTION.

As so many fresh students seem to be taking up the order *Coleoptera*, it has been thought that a few words as to the habitat, &c., of some of our British species might be of service to many readers of this journal.

Full particulars as to the anatomy of beetles, methods of collecting, setting, &c., are given in Rye's 'British Beetles,' which is by far the best book with which to begin the subject; but it may not be amiss, in an introductory chapter, to give a few useful hints on certain points.

As far as apparatus is concerned, the chief things wanted for ordinary work are a strong fern-trowel, a stout ring sweeping-net, and an umbrella. I used to find that the rings I bought at ordinary makers were quite useless for the rough sweeping necessary for Coleoptera. My nets were perpetually breaking; and there is nothing more annoying than to have one's net rendered utterly useless in the middle of a good day's work, as happened to myself one fine day in the New Forest. At last I got one made at a gunsmith's, which has never failed; it cost about three times as much as an ordinary net, but has saved its cost over and over again. The umbrella answers all the purposes of a beating-net, besides being convenient if it comes on to rain, while the butt end of the ring-net serves to beat with, so that by a little management one can beat and sweep over the same ground. The nets themselves should be furnished all round their upper edge with stout rings, and not with a turned-down edge of calico, as is the case with nets for Lepidoptera: by adopting these, the nets are saved from being worn out, and are easily run on and off the big rings, so that a water-net can in a very short time be substituted for a calico sweeping-net, or *vice versá*. The fern-trowel acts as digger, stone-turner, and bark-ripper, and is indispensable where any dirty work has to be done. For wood work a miniature sort of pick-axe (axe one side and mattock the other) is necessary; Mr. Crotch, I believe, first designed this very useful tool.

The second great point on which coleopterists are always going wrong is the laurel for killing and preserving; very few seem to understand how to use it, and cannot keep beetles in it for a fortnight without their turning mouldy, much less for a year or two, as is very often done. The laurel must be gathered on a warm, sunny day, and the young leaves only must be used; they should be chopped fine, and put into quite air-tight bottles or tin boxes. The beetles should never be kept longer than three or four days (the more fragile ones only one day) in contact with the laurel, but should be picked out and put into muslin bags, and placed in store bottles half full of chopped laurel, which should be watched carefully to see that the laurel does not get damp or mouldy. Every week or so each bag should be opened, and the beetles thoroughly aired before being replaced. If these directions are followed, there will be little fear of mould; should it, however, make its appearance, it is easily removed either from unset or cabinet specimens by a mixture of one part of carbolic acid with ten or more parts of benzine. In winter, when strong laurel cannot be got, a little of this mixture on cotton-wool, put into the laurel collecting bottle, soon kills the beetles, which are afterwards relaxed by the laurel, even if it be weak, although, of course, it takes a longer time. The smaller *Staphylinidæ*, *Trichopterygidæ*, &c., should always be collected into small bottles of spirits of wine and water (about half and half); if soon set they come out beautifully, retaining all their pubescence, which else is very easily rubbed off.

The harder beetles should never be put into spirit, as there are very few of them that can be set satisfactorily afterwards, nor should any of the species of *Staphylinidæ* with scarlet elytra, as it spoils their colour entirely. A little experience, however, will soon teach the uses both of laurel and spirit. If the collector has time to set the beetles as soon as captured, by far the best plan for killing all species, without exception, is by throwing boiling water over them. This kills them instantaneously, so that even those species which most quickly withdraw their antennæ and legs into deep recesses have no time to do so, and are therefore much more easily set. They should not be thrown into the water, as, in the act of falling, many species will spread their wings, and be rendered useless as cabinet specimens.

A few words, perhaps, as to the actual setting may not be out of place: the insect should be laid on its back, and its limbs carefully brushed out with a hard blunt brush—an ordinary fine brush cut back some way is the best implement; it should then be taken up by a fine, though hard, pointed brush, and laid on card on which some gum has been spread, and its limbs brushed into place. If refractory, the limbs may be easily put in position by means of a needle or a bent pin, which last is very useful for drawing out such limbs as may have retreated under the body. Many beetles, especially minute ones, such as *Scydmænidæ*, *Lathridiidæ*, *Halticidæ*, &c., may be almost entirely set with the needle, without any brushing out, but species of other families, such as *Curculionidæ*, *Histeridæ*, *Byrrhidæ*, &c., require to be most carefully brushed out before being placed in position. The pinion feathers of snipe or woodcock are exceedingly good brushes for the smaller species, as they are hard, and come to a very fine point: Mr. Matthews, whose experience in the smaller is greater than any living entomologist, has, I believe, used these feathers for the whole of his *Trichopterygidæ*. The *Staphylinidæ* are perhaps the most aggravating, as, in the first place, owing to the formation of their anterior coxæ, they are very hard to set flat, and it is the *sine quâ non* of all setting of beetles that they should be straight and flat on the card; and, even if this be overcome, they have a habit of curling up, the segments of the abdomen all telescoping and rendering the insect an unsightly object generally: if, however, the anterior legs be drawn backwards instead of forwards (and they look just as well), and if an extra supply of gum tragacanth or a little pure gum arabic be placed under the tail, both these disadvantages will be avoided; a card brace for the abdomen is also a perfect remedy for contraction.

The gum, as just mentioned, should be gum tragacanth, but two or three lumps of gum arabic should always be added, and a little carbolic acid or spirit to preserve it from decomposition, which soon sets in otherwise.

The card should not be smooth, but rather roughened on the surface: a thick post-card is an excellent type of card for general setting, and as it is to be obtained at all country post-offices it may come in very useful in out-of-the-way places, as an innumerable quantity of beetles may be set on one such card, if cut up into small strips.

The pins used should not be too thick or too long, and the beetles should not be raised more than half an inch up them; if they are raised very high, as is the custom in some collections, they are much more apt to jerk off the card when removed from one box to another.

It is perhaps waste of time to set all the minute species correctly; but unless they are set flat, with the antennæ and one anterior leg at least fully showing, they are in many cases utterly useless: it is almost impossible to name many of the *Meligethes*, *Saprini*, &c., without these parts being clearly displayed, the distinctive characters not only of species but of genera depending entirely upon them.

The localities in which Coleoptera may be found, and various methods for their capture, will be mentioned in forthcoming papers; but there are two points that well deserve consideration, which are considered essential with lepidopterists, but are almost entirely neglected by coleopterists, and these are breeding and sugaring. The life-histories of very few beetles are known, and will well repay study. The larvæ of many species, especially the wood beetles, are easily obtained; from a few bored twigs, casually picked up last January under some fir trees, I bred in June *Tomicus bispinus*, *Lissodema* 4-*pustulata*, and hundreds of *Pityophthorus micrographus*, and the very rare *Tropideres sepicola* has, I believe, never been obtained in any other way. As to sugaring, it is well known that the larger *Carabidæ* come to sugar, but it is not generally known that if a little moss be sugared and put into a hole in the ground, or in a hole in a tree, it will often produce very rare species of the smaller insects.

In conclusion, it may be said that there is yet a wide field open to discovery as far as Coleoptera are concerned, and any coleopterist may soon make a name for himself by the discovery of *Adelops* in our many bone caves, of *Anillus* under the Snowdon boulders, or of *Langelandia* in buried logs of wood in any part of the country.

I would only add that it is almost impossible to collect Lepidoptera and Coleoptera together with any comfort: as, however, it is very annoying to miss some rare species, a brass Y and folding sugaring-net may be carried in the pocket, and the sweeping-net will usually suffice to hold the insect until the gauze net is got ready to receive it.

The School House, Lincoln, January 5, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Rhopalocera at Llandudno. — As a supplement to Mr. Porritt's note in the September number (Entom. xiv. 215), the following particulars as to the butterflies of Llandudno may be worth recording:—*Gonepteryx rhamni* is not often met with; *Colias Edusa*, which is rare this season, was taken in large numbers at Colwyn Bay in 1877, and *C. Hyale* is to be found on the banks of the River Conway. Of the whites, *Pieris brassicæ* is oftenest seen. *Vanessidæ* are well represented; *Vanessa cardui* was very common in 1880, but I did not see one this year. *Vanessa Io* and *V. Atalanta* rival *V. urticæ* in numbers, while *V. polychloros* is not rare on the Great Orme. *Vanessa C-album* makes the Gloddaeth [illegible] ts head-quarters, occurring plentifully, where also *Argynnis*

Aglaia and *A. Adippe* are found together. *A. Paphia* is scarce, but *A. Selene* and *A. Euphrosyne* the reverse. A lane leading to Gloddaeth is a noted locality for *Nemeobius Lucina*. *Thecla quercus* is common, but I have only taken one specimen of *T. W-album*. *T. rubi* is plentiful near Llandudno Junction. Of the blues, *Lycæna Alsus* is very common in the woods, where *Anthocharis cardamines* and *Satyrus Egeria* literally swarm each spring. I have seen *Lycæna Argiolus* in profusion flying over the ivy on Conway Castle, and last year took a long series of *L. Agestis* on the Great Orme. *Thanaos Tages*, *Hesperia sylvanus*, and *H. linea* occur on the sand-hills, where I have also taken some very large specimens of *Polyommatus Phlæas*. Of all the butterflies *Satyrus Semele* is the commonest, being met with everywhere in extraordinary numbers every season. I was unfortunate as to weather this year, for, although fine, it was very dull, only getting three bright days in three weeks, from July 29th to August 19th; while last year the first fortnight in September was far more favourable for collecting, the latter being the month I should recommend for a visit to this splendid watering-place, as all insects are later on the wing than inland.—MARTIN J. HARDING; Murivance, Shrewsbury, Nov. 7, 1881.

ARGYNNIS PAPHIA *var.* VALEZINA.—In a former number a correspondent inquires whether *Valezina* has been taken coupled with *A. Paphia*. I once took such a pair at Fontainebleau. Prof. Frey, of Zurich, records the same. I may add that this year I took a pair of black *Xylophasia polyodon* in cop., showing that in this case the melanism is not confined to one sex.—WM. F. de V. KANE; Kingstown, Ireland, Feb. 10, 1882.

THE EFFECT OF HEAT UPON NOTODONTA DICTÆA.—That artificial heat should materially affect the usual time of occurrence of Lepidoptera is not at all surprising; but that the season being a little milder or colder than usual should decidedly alter the normal times of appearance is certainly interesting. For instance, I took *Nonagria lutosa* in fine condition so late as November 10th, while five days later *Phigalia pilosaria* was on the wing. Again, the first week in the present January, *Hybernia leucophearia* could be seen both in a fresh and worn state, indicating that it had been a witness to the coming in of the new year. But my present object is to offer a few remarks with reference to the great heat of last summer in breeding *Notodonta dictæa.* Having taken and watched the life-history of this species for several seasons, I have observed that warmth is indispensable to the successful rearing of the insect; hence I fully hoped that the warm weather of August and September, 1880, would produce a good spring brood in 1881. That wish was realised, for I easily took two or three each evening during the latter part of last May, from which were obtained a plentiful supply of eggs. From these emerged 140 larvæ, which in a few days were "sleeved" out on *Populus dilatata.* The rapid manner in which they grew during the great heat of the 3rd, 4th and 5th of July was very conspicuous. Upon the last-named date the thermometer was 92½° in the shade, but on the 6th it fell to 56°. This sudden change caused an equally sudden result upon the larvæ, for in the evening I found, to my regret, that six were dead, and the remainder in a semi-torpid state; to arouse them it was quite essential to place them at no great distance from a fire. By the 11th the temperature was again high, and the *N. dictæa* once more in a thriving condition. The next instance worthy of note occurred on the 15th; here it will be remembered that this was the hottest day on record in this country, and, as I have since found out, too hot for success in procuring perfect imagines of this species, as the following facts will show. On the evening of the 14th all the larvæ were feeding; but on looking in the breeding cage twenty-four hours later there were actually seventeen changed to pupæ, and lying wholly exposed on the surface of the mould. These ultimately produced fifteen deformed, and only two perfect, specimens. After July 16th the temperature did not exceed 89° in the shade, a maximum which was registered for the three succeeding days. This period was long enough to enable about 100 to pupate, nearly all of which followed the usual rule of forming a subterranean cocoon, and in due time, with few exceptions, yielded fine imagines. The first moth appeared on July 25th, and the last on September 6th. There are two pupæ left, which are alive and passing the winter in that state. In conclusion I may add that to secure *N. dictæa* in proper condition it was necessary to arouse oneself between the small hours of 2 and 3 a.m., as the great majority persisted with the utmost regularity in emerging from 12 to 12.30 p.m. Now to kill them at once was out of the question, and to leave them to enjoy the time essential for rest in order to resuscitate the energies of man, simply meant utter ruin to the moths.—H. T. Dobson, jun.; New Malden, Surrey, January 14, 1882.

Re-occurrence of Eupithecia extensaria.—At page 108 of vol. viii. of the 'Entomologist' is recorded the capture of a single specimen of *Eupithecia extensaria*, which was then added to the British list of Lepidoptera. Again, in the same volume, pp. 132 and 133, are further remarks upon this species, which was then considered, even by its captor, as possibly introduced into this country by some of the steamers trading between Hull and Russia. It is highly satisfactory to find—again through its first discoverer, Mr. William Prest, of York—that this species has been taken in another part of Holderness, and many miles from the first locality of its capture. The particulars as given by Mr. Prest are as follows:—"In looking over some boxes belonging to Mr. James Buck, one of the oldest collectors in Hull, I espied an insect which seemed familiar to me. On closer examination I found it to be a male specimen of *Eupithecia extensaria*. Mr. Buck told me that he well remembered taking it about ten years ago, while it was sitting on wormwood (*Artemisia*), at Spurn Point, in Yorkshire. He and several others had been there for tern's eggs, and in coming home he saw the moth at rest. Having no collecting-boxes with him, he brought it home in his tobacco-box. Mr. Buck kindly gave me the specimen which is now in my collection." On such evidence as this one would think the Hull entomologists should now turn up this species, which appears equally rare on the Continent and in this country.—John T. Carrington; February, 1882.

Early Lepidoptera.—While examining the trees in Richmond Park, Surrey, on January 29th, I found imagines of the following species:—*Nyssia hispidaria*, *Phigalia pilosaria*, *Hybernia leucophearia*, *H. progemmaria*, *Anisopteryx æscularia*, and *Tortricodes hyemana*. I never remember during my long experience as a lepidopterist taking so many species on one day so early in the year.—E. G. Meek; 56, Brompton Road, S.W., January 30, 1882.

Nyssia hispidaria.—On the 12th of February I and my friend Mr. Franklin took seven specimens of the above insect in Richmond Park, and saw several others taken, showing, although somewhat early, that the species was fairly out. *Hybernia leucophearia*, *Anisopteryx æscularia*, and *Phigalia pilosaria* were also well represented.—W. J. Harper; 66, Mansfield Street, Kingsland Road, February 18, 1882.

ANERASTIA FARRELLA.—I note that Mr. Edward A. Atmore, in a contemporary, records the re-discovery of *Anerastia Farrella.* This should scarcely be called a re-discovery, because it has been taken many times since [illegible], the date mentioned as that when the late Mr Farr [illegible] Norfolk, by Mr. Thomas Brown, of Cambridge, on the sandhills near Yarmouth, while searching for *Crambus contaminellus.* The first of Mr. Brown's specimens occurred about [illegible]. These specimens passed through my hands, and are now distributed among various collections in this country.—E. G. Meek; 56, Brompton Road, S.W., February 9, 1882.

[illegible] IN ENGLAND.—It may interest your readers to know that I have a specimen of this rare species taken in Kent, and also a specimen in Norfolk, which were captured by the Rev. H. Williams last season, and given to me. When I called his attention to it he wrote me he had taken another, but did not know its importance. Both of the specimens are larger than a specimen Mr. Dunsmore sent to me, which he took near Paisley some years ago. When placed beside *C. farinatella* it may readily be detected by the facial band being brown. It is also a larger insect, and not as chubby looking.—J. B. HODGKINSON; Preston, February 9, 1882.

LEPIDOPTERA NEAR MARLBOROUGH.—The year 1881 was an unusually favourable one for the entomological members of our Natural History Society. Among the butterflies caught, *Apatura Iris, Lycæna Alsus, Melitæa Artemis* and *Nemeobius Lucina* deserve special mention. Among the moths we can record the capture of *Stauropus fagi, Procris Geryon, P. statices, Nemeophila plantaginis, Euthemonia russula, Geometra papilionaria,* and *Iodis vernaria.* Seven new species have been added to our list, four of them *Eupitheciæ,* of which *E. irriguata* and *E. consignata* are rare. It is a curious fact that most of the insects above mentioned, especially *L. Alsus, M. Artemis, N. Lucina, P. statices* and *G. papilionaria* turned up abundantly last year, after being seemingly extinct for several years previously. The time of their appearance was very limited, five days being the period during which *M. Artemis* was found, and all the specimens of *G. papilionaria* (seven in number) were taken in less than that time. Is there any special reason for their sudden reappearance and short existence? Our sugaring was hardly so successful as usual;

perhaps unfortunate nights were chosen, and we can record the capture of no rare or local Noctuæ.—P. H. MADDOCK; Marlboro' College, January 22, 1882.

LEPIDOPTERA AT IVY IN IRELAND.—I may perhaps supplement the recent notices of captures at ivy bloom by the following notes of insects taken on this side of the Irish Channel during the autumn. In September I hardly took any insects at sugar in Lord Howth's demesne—a locality which I expected would have proved prolific of valuable insects. Any I took were at light—namely, *Ennomos erosaria*, *Epunda lichenea*, *Eubolia cervinaria*, *luperina*, *testacea*, and *Hydræcia micacea*. The magnificent crop of yew berries proved equally unattractive, only a couple of *Phlogophora meticulosa* having been seen. In October, however, *Xanthia ferruginea* and *Miselia oxyacanthæ* came freely to sugar and light, and near Kingstown at ivy later on in the month; and in November I took the following—one *Agrotis saucia*, a few *Xylina rhizolitha*, *Cidaria miata*, and *C. psittacata*; *Anchocelis pistacina* and *Xylina petrificata* more abundantly; while *X. ferruginea* and *P. meticulosa* were exceedingly numerous; and not less so *M. oxyacanthæ*, but the latter seems to be attracted rather by light than ivy; *Scopelosoma satellitia* was also very common, and *Calocampa vetusta* not rare. *C. exoleta* seems not to occur in the neighbourhood; while neither *Orthosia macilenta*, *O. lota*, *Anchocelis rufina*, *A. litura*, nor *Cerastis vaccinii* put in an appearance. *Cheimatobia brumata* abounded in the hedges in November. During the summer I took *Stilbia anomala* on cliffs by the sea, or pastures beside the shore. I sought unsuccessfully for it in Howth Castle demesne, where the larva should occur if Newman's description of its favourite haunts is correct, namely, "open parts of woods." It would be interesting to know whether my observations can be confirmed by those who have taken this insect in other localities, in the South of England or at Kinloch Rannoch, in Scotland. One of my specimens is of a deep blue-black on the fore wings.—WM. F. DE V. KANE; Kingstown, Ireland, February 10, 1882.

ENTOMOLOGICAL EVENING AT THE ROYAL AQUARIUM.—At the "Entomological Evening," held at the Royal Aquarium, on Monday, February 6th, about forty gentlemen attended. The more interesting exhibits included a new *Coleophora* from Wicken Fen, also fine series of *Eupithecia Helveticaria*; the former taken last June, and the latter recently reared by Mr. Meek. Mr. G. Elisha brought for exhibition *Polia chi*, varieties *olivacea* and others intermediate between that and the type; perfectly black *Eupithecia rectangulata*; also melanic *Diurnea fagella*. Mr. Cooper, a very fine series of varieties of *Hybernia defoliaria*, taken by himself near London. Mr. Machin showed a box of rare Lepidoptera, including *Phycis adelphella*, *Eupœcilia ambiguana*, *Argyrolepia maritimana*, and *Lemnatophila salicella*. Mr. T. A. Clark, a series of remarkably large *Eupithecia expallidata*. Mr. Jones, preserved and living larvæ of lepidopterous insects. Mr. South brought an exceedingly interesting box of the *Pterophoridæ* from North Devon and elsewhere: among them were examples of those recently described in this magazine; the distinctness of his new species, *Amblyptilia tæniadactylus*, as compared with *Platyptilia Zetterstedtii*, was noted. Mr. G. Clark sent for exhibition a beautiful series of the rare *Crymodes exulis*, taken by him last summer in Inverness-shire: they were remarkable for the uniformity of type which characterises Scotch examples of this moth, when compared with the very variable form occurring in Iceland.—J. T. C.

Pulex Feeding on Lepidopterous Larvæ.—Some time ago I visited a seed warehouse, and, seeing a number of larvæ feeding on some peas, I took a quantity of them home to examine. I detected amongst them the larvæ of *Œcophora pseudospretella* and *Endrosis fenestrella*. Another larva was there which I could not make out. A short time ago, however, the question was solved by the emergence of a number of fleas, apparently *Pulex irritans*. On closely examining them I found the stomach fluids quite transparent, and not red in colour, as when the lively little torments have fed upon mankind. This fact led me to watch them more closely, with the result that I found them feeding liberally on the juices of the above-mentioned lepidopterous larvæ. I gathered some consolation on seeing my lively little friends feeding on two species of larvæ, which frequently cause us lepidopterists so much annoyance by in turn feeding on our carefully stored pupæ. I should mention that those larvæ which had been attacked by the fleas appeared to pine away and die. I had nothing but peas, fleas, and larvæ in the gallipot, covered with plate-glass, through which I observed this economy of nature.—Chas. J. Boden; 153, Snows Fields, S.E., February 15, 1881.

Lancashire and Cheshire Entomological Society.—The annual meeting of this vigorous Society was held in a lecture-room at the Free Library, Liverpool, on the 30th January, the president, Mr. S. J. Capper, in the chair. After re-election to that office for the sixth time, Mr. Capper gave an interesting *résumé* of the history and work done by the Society since its foundation early in 1877. Since that period fifty-six meetings had been held, at which fifty-one papers had been read, forty-five of which had been contributed by its own members, which now number about sixty. A circulating library of entomological works has been formed, with a goodly number of volumes, and more pleasing still is it to find how largely it has been used. Much praise is due to the officers, whose energy has brought about this desirable condition.—J. T. C.

OBITUARY.

Robert W. Sinclair.—This high-spirited and energetic young entomologist died January 28th, somewhat unexpectedly, of acute pneumonia, at Sir Patrick Dunn's Hospital, Dublin. Mr. Sinclair, whose age was but twenty-two years, was the son of the late Robert S. Sinclair, LL.D., Minister of Public Instruction in the Province of Berar, India. Sad as it is at all times to part with an ardent lover of Nature, it seems doubly so when it is he who only a few weeks ago was pleasantly chatting with us, and apparently promising so much in after life. At the funeral of Mr. Sinclair, which was largely attended by his fellow-students of Trinity College, Dublin, Professor Houghton, in an address given at the grave, having paid a high tribute to the deceased's father, added, "and his son, whose early death we now deplore, bid fair to outshine him." Only a few days before his death the Royal Hibernian Academy gave him a grant to enable him to continue his entomological researches during the coming season. Mr. Sinclair was intended for the medical profession, and had but one examination to pass before completing his college course.—J. T. C.

J. W. Jobson.—It is with regret we have to announce the early death of this young collector, so well known for his energetic work in the New Forest, &c. Mr. Jobson fell a victim to our national disease—consumption—at the age of twenty-one years. He died at his father's house, Leyton, on the 10th February.—J. T. C.

NOTES FROM CURRENT ENTOMOLOGICAL LITERATURE.

Economic Entomology.—The Report of the Judges on the Derby Prize-Farm Competition, 1881, has been issued in the 'Journal of the Royal Agricultural Society of England,' vol. xxxvii., part ii. In this report will be found many interesting references to destructive insects amongst farm crops. Those most attacked were oats by *Oscinis vastator*, Curt.: of this it is said (p. 467)—"Insect life was very active this spring, despite the severity of the winter. A tiresome tiny maggot attacked the stem of the oats soon after it was above ground, and, penetrating its inner case, cut off the shoot which should have produced the ear. The plant for a time looked dead, but subsequently made an effort to recover itself and put forth a number of minute faint stems many of which produced a diminutive ear. The result of the attacks of this insect had a most damaging effect upon the oat-crop." The mangold-wurzel fly (*Anthomyia betæ*) is repeatedly referred to by the Judges as more or less destructive (pp. 467, 481, 493, 510, 524, and 530). Various remedies against this pest are suggested (p. 468), chiefly with a view to stimulating the plant so as to enable it to outgrow the attack of the larvæ of *A. betæ*. Amongst these remedies were "guano, nitrate of soda, and mineral phosphate," the latter being said to be best. Soot is also mentioned as of advantage. We are very glad, however, to note that the most successful remedy appears to be the encouragement of small birds. At page 481 the report says—"In Mr. Bryer's fields and in others we have noticed flocks of little birds, mostly sparrows and chaffinches, that were feeding on the insects. So well had they done their work at Markeaton Park, that we had some difficulty in finding a maggot in the leaves; the vesicle had been torn open and the maggot removed, let us hope into safe custody." Reference is made (p. 530) to the turnip beetle, *Phyllotreta nemorum*, Linn., which seems in this instance to have been cured in the following manner—"by drawing over them elder boughs, horse-hoeing with elder boughs tied to the sides of the horse-hoe, rolling, sprinkling with diluted paraffin, and finally with fresh-slaked lime." It is not suggested which remedy proved most effectual, probably the paraffin, for in "Through the Light Continent" (p. 58) Mr. Saunders mentions that remedy as most generally used with success in Colorado, against-potato bugs and grasshoppers.

Sericiculture.—In the 'Journal of Science' for February, Mr. J. W. Slater reviews the "Handbook of the Collection illustrative of the Wild Silks of India in the India Museum," by Thomas Wardle. Mr. Slater makes some pertinent remarks which are worthy of perusal by those interested in the production of silk, whether from a commercial or natural-history point of view.

Ichneumon Parasites of Butterflies.—Mr. A. S. Packard, in 'Proceedings of the Boston Soc. of Nat. Hist.,' vol. xxi., part i. (published November, 1881), gives descriptions of some new Ichneumon parasites of North-American Butterflies. In this paper Mr. Packard refers to some score species, most of which he has described as new to Science.

Ichneumonidæ of Devonshire.—Mr. Ed. Parfitt, in 'Report and Transac. of Devon. Assoc.,' 1881, p. 241, contributes to the fauna of that county a list of ichneumons observed therein. The list, with introductory notes, occupies upwards of fifty pages, and will be found useful to students of that order. J. T. C.

THE ENTOMOLOGIST.

Vol. XV.] APRIL, 1882. [No. 227.

ON THE DISEASES OF LEPIDOPTEROUS LARVÆ.

By A. B. Farn.

Having been looking through the manuscript of a translation which I made some years ago of M. Pasteur's masterly work on 'Diseases of Silkworms,' I thought that parts of it might have some practical bearing on the rearing of lepidopterous larvæ generally, and I accordingly send for publication the following hints on the disease with which, it appears to me, lepidopterists are most concerned.

M. Pasteur attributes the disasters which, for the last twenty or more years, have attended commercial silkworm-rearing, to two principal diseases, namely, to "*pébrine*," or spotted disease, and to "*flacherie*." To sericulturists the former of these diseases is of the greater importance, while to rearers of our indigenous larvæ the latter appears to be the greater evil.

Pébrine is not only a contagious, but essentially an hereditary, disease, and (as will be readily understood) entails great loss where the same species has to be reared for an indefinite number of generations, and where, as in the case of the silk-moth, wild specimens cannot be taken to deposit eggs for fresh rearings. Those entomologists who rear specimens from the eggs for their collections do so for a few generations at most, and start again from time to time with eggs from wild specimens; thus almost, if not entirely, avoiding a disease which becomes more formidable to each successive generation. *Flacherie*, although it may be hereditary, may on the other hand be suddenly developed in a brood of larvæ, and kill every individual;

and for these reasons it is the disease which most affects us. *Flacherie* is most fatal just as larvæ are arriving at maturity. The larvæ have apparently fed up well, and although there have been a few deaths they have not been sufficiently numerous to cause serious alarm and have been attributed generally to diarrhœa. When nearly full fed, and in appearance healthy, they are so feeble that their movements are scarcely perceptible; they stretch themselves out on their food-plant or on the top or sides of the rearing-cage, and remain without moving till they die, frequently hanging down supported only by some of their claspers. In these positions they sooner or later become flaccid, sometimes this takes place in a very short time, and they putrefy and turn black in twenty-four hours, the skins being filled by decomposing fluid—being "moist unpleasant bodies," as Mr. Mantalini would have remarked. It is said that, if a silkworm rearing-house (*magnanerie*) is entered when the worms are dying of *flacherie*, a sour disagreeable odour is perceptible, due to volatile fatty acids formed by the fermentation of the matter contained in the intestinal canals, and which is given off by the worms. Death is due to the derangement of the digestive functions supervening on the fermentation above mentioned; and it would appear that the disease may be communicated to healthy larvæ by soiling their food with the fermenting matter from the intestinal canal.

Flacherie is due to overcrowding of larvæ, to undue moisture in the atmosphere, to too-succulent food or to food given when very damp, or to defective aëration of the breeding-cages. Some of these causes may develop fatal effects within twenty-four hours; others simply weaken the larvæ, and sow the seeds of disease which will afterwards decimate the brood. Larvæ do not urinate, and the large amount of moisture they as a rule take in with their food has in great measure to be got rid of by transpiration; anything, therefore, which checks this transpiration is injurious.

If a few large larvæ with their food be placed in a perfectly-closed vessel, they will in a very short space of time be covered by moisture which they have transpired, and which there has been no current of air to carry off. Internal-feeding larvæ, even under natural conditions, seem very liable to die of this disease. I have frequently noticed larvæ of the genus *Sesia* dead of it, as also those of the genus *Nonagria*—larvæ, in fact, feeding in a stagnant, moist atmosphere.

A dry atmosphere and a good current of air are essential to the well-being of larvæ; and, on the other hand, it is necessary that the food should be free from external moisture, such as rain, mist, dew, &c., and not of too young or luxuriant growth. If watery ejections are noticed in the rearing-cage, be sure that there is at least a stagnation of air; and nothing is more fatal to the health of larvæ than a moist and stagnant atmosphere. A vessel containing quick-lime might be placed in the rearing-cage with advantage, the larvæ of course being prevented from contact with the lime, which will absorb much of the humidity in the cage.

Greater success is likely to attend the rearing of small batches of larvæ than when many are placed together. Where possible, larvæ, I find, do best when confined in gauze bags on their food-plants; if they are thus bagged on branches, care should be taken that, however high the wind may be, the branch will swing free of all obstructions. In wet weather the larvæ should, if fed up in cages, be placed in a room where there is a current of air—in front of an empty fireplace, for instance.

The Dartons, Dartford, March 9, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. II.—OUR OWN HOUSES.

In treating of the natural localities of British Coleoptera, the question arises whether it is better to take the different groups in order, and point out where the members of these groups are to be found; or whether it is better to take different localities, such as a wood, the sea-shore, a hay-stack, rotten wood, &c., and say a few words on the beetles that are likely to be found in these localities. The first course is the most satisfactory from a scientific point of view, as different groups are usually formed for peculiar habitats, and are usually found in such habitats, though it may be in different parts of the country. Still there are great exceptions to this rule; thus we may very often sweep or beat ground-beetles off herbage or trees, and many species are found under bark; many of the carrion beetles, too, are often found on flowers. As, then, these papers are meant merely to serve as hints to beginners, as showing them roughly where they may expect to find certain groups or certain particular insects, it seems preferable to adopt the second course, *viz.*, to take different localities and point out what beetles we may expect to find, if we work them. At the same time it must be understood that this at times may involve a little repetition and a little confusion, for, as we first saw, there are many beetles that are found in the most varied positions; in fact some seem almost ubiquitous, and turn up wherever one goes.

We need not go far to begin; we have a very fair collecting ground in our own houses. Of course "black-beetles" will at once occur to the beginner, but these belong to the Orthoptera, and are, therefore, not Coleoptera at all. There are, however, plenty of *bonâ fide* beetles. We may perhaps first mention the elegant steel-blue cellar beetle, *Pristonychus terricola,* which is often common in cellars and outhouses. *Sphodrus leucophthalmus* is another species that haunts the same localities, but prefers bakehouses; it is apparently rare, although said to have been common near the metropolis. Species of *Blaps* are also found in the same places. Wine-cellars are often productive of good species, which inhabit the dark-looking fungi that grow on the walls. Not long ago I received *Atomaria nigripennis, Mycetæa hirta,* and the rare *Orthoperus atomarius* from such a cellar in Gloucester; the latter, I believe, had only been taken before by Mr. Crotch, at Devizes. *Atomaria nigripennis,* the prettiest of the *Atomariæ,* is mentioned by Stephens as common in cellars at Nottingham. Several species of *Cryptophagi* also occur with these beetles.

The wood-work of old houses is often infested with beetles; every one has heard of the "death-watch," whose ticking in the silence of the night has caused much fear to superstitious minds; this noise is caused by certain species of *Anobium,* probably by the clicking of their mandibles while working or calling their mates. *Anobium striatum* is the commonest: this is the species that makes the little round holes in old furniture with which we are all familiar. *Xestobium tessellatum* is also a common species locally. Another member of the group, *Anobium paniceum,* prefers bread and farinaceous substances to wood. Many species of *Ptinidæ* also occur,—of these *Ptinus fur* and *P. crenatus* are the commonest; while the pretty *Ptinus sexpunctatus* is always a rarity. *Mezium affine*, looking like a ruby in a bright light, and *Gibbium scotias*, its close ally, must not be forgotten. I once received a very large number of the former species, taken in London, from Mr. G. C. Champion; the latter seems very rare or hard to get hold of. The commonest beetle, however, of this class is *Niptus hololeucus*, which at one time was considered a rare insect, but is now exceedingly abundant; it is often called the "wine-glass" beetle, from dropping into wine-glasses in old cupboards, and, being unable to get out, is so captured.

Our natural-history collections often suffer very much from beetles, *Ptinus fur*, above mentioned, being, as its name implies, the most mischievous, although perhaps *Attagenus pellio* is the worst pest of insect collectors. *Megatoma undata* occasionally turns up in boxes of insects, and rare *Lathridii* occur sometimes in collections of plants. Mr. P. B. Mason, of Burton-on-Trent, last year found several specimens of the very rare *Lathridius filum* in his herbarium. *Anthreni* larvæ also are sometimes destructive. While on the subject of damage we must not forget to mention *Dermestes lardarius*, which is often found in bacon, and all the various species of granary beetles, of which so extensive a list is given by Mr. Billups in the 'Entomologist' for Sept., 1880 (Entom. xiii. 208). Foremost among these come the *Calandræ*, then *Tenebrio obscurus* and *T. molitor* (whose larva is the well-known meal-worm), and then *Trogosita, Lemophlœus, Tribolium, Alphitobius, Rhizopertha*, and others. The great majority of these "granary beetles" ought not to be in our lists, being merely importations; but, as it is hard to eliminate those that are not British, it is necessary for us to include the whole in our collections at all events. Many true British species, such as *Homalium concinnum, Oligotæ*, and other *Staphylinidæ*, and occasionally also the rare *Mycetophagus quadriguttatus*, may be found in wheat or flour bins in farm outhouses.

To pass on, one of the best methods of collecting in the house is from the windows. All of us know how, on a warm summer's day, the windows seem alive with small insects, and if we examine them we shall find that a great majority of them are coleopterous. These mostly consist of small *Staphylinidæ* (especially *Oxyteli* and *Homalotæ*), *Trichopterygidæ*, *Lathridiadæ*, &c.

One day at Hunstanton I casually bottled a few *Trichopterygidæ* off a lodging-house window; one of these turned out to be *T. Guérini*, a species hardly ever before taken, and another, *Smicrus filicornis*, which had never been captured in Britain except by the Rev. A. Matthews. *Euthia*, and often *Scydmænidæ*, may be taken in the same way. The corridors of the Crystal Palace are celebrated for this particular method of collecting, and I hope that some of the numerous rising generation of London coleopterists will work them during the coming season, as they will be sure to reap a good harvest. *Trichophya pilicornis* has been taken there abundantly; and many good *Cryptophagi*, besides hosts of other things.

If an old log be put on the fire, the windows should be carefully examined, as numbers of wood-beetles may be found which have been driven out of the wood by the heat. I remember swarms of *Hylesinus oleiperda* having been taken in this way by Mr. W. G. Garneys, of Repton.

In conclusion, I would say, do not neglect your doorsteps. These are often whitened, and attract many good species. Mr. Harris, in this way, took *Bagous diglyptus* (new as British and rare on the Continent) at Burton, and a short while ago I took *Oxytelus insecatus* (which has not, I believe, been before recorded from this district) in the same fashion.

Good beetles, such as *Lathridius carinatus*, *Bembidium quinquestriatum*, and others may be often found on the outside walls of a house; and besides all these there are beetles in thatch, beetles in pigeon-cotes, beetles in sparrows' nests in our water-pipes, beetles in all our surroundings; but these had better be treated of under some other heading.

The School House, Lincoln, February 1, 1882.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ.*

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

Phæogenes, *Wesm.*

The females in this genus are generally furnished on the under side of the hind coxæ with a distinct process, varying with the species. For the sake of brevity we give a list of the different forms, as described by Wesmael in his 'Teutamen' (p. 180). A sign is placed before each form, and these again will be placed in parentheses before the insect to indicate the structure of the coxæ of each female. The genus *Diadromus*, Wesm., was distinguished from *Phæogenes* by having the apex of the clypeus abruptly depressed. Wesmael afterwards thought these two genera might be united; and as Mr. Marshall has merged them in his catalogue we shall do the same. *Phæogenes collaris* was included by Gravenhorst in the genus *Ischnus*, it having a very prominent scutellum; but Wesmael thought the petiole was too long and slender for it to remain there, so he moved it to *Diadromus*.

(1.) The process beneath the hinder coxæ in the form of an abrupt tooth.
(2.) The process in the form of an oblique keel, with the apex produced into a longer or shorter (sometimes subobsolete) tooth.
 (x.) Keel of coxæ straight or somewhat sinuous.
 (xx.) Keel of coxæ interrupted.
(3.) Process in the form of a small crest or oblique line.
(4.) Hind coxæ without any process.

Section 1.—Thorax and abdomen black; antennæ of female generally white-ringed.

A. Femora and tibiæ red (male and female).
5. (2. x.) *stimulator*, 3¼—4 lines.
B. Legs red; hind tibiæ and tarsi dark; the former pale-ringed in the middle, the latter pale at the base of joints (male and female).
6. (2. x.) *calopus*, 2½—3 lines (*l*, *a*).
C. Legs almost entirely black (females).
a. Antennæ white-ringed. - 12. (4.) *cephalotes*, 3½—4½ lines (*a*).
b. Antennæ red. - - - - - - (4.) *similis*, 2¾ lines.

Section 2.—Scutellum pale marked (sometimes black); abdomen black.

Femora, front and intermediate tibiæ, red (male).
19. *candidatus*, 3½ lines (*s*).

Section 3.—Scutellum pale (white or whitish, A and C; red, B); abdomen red and black.

A. Abdomen red, base more or less black or fuscous; antennæ white-ringed (females).
a. Legs red; front coxæ whitish; spine on hind coxæ long.
4. (1.) *scutellaris*, 2½—3 lines (*s*).

b. Legs red; hind coxæ and femora black; hind coxæ unarmed.
14. (4.) *troglodytes*, 3 lines (*l*, *s*).
B. Abdominal segments, 2nd to 3rd or 4th, vary from yellow-red to brown-red, or almost black; legs and antennæ red; generally pro- and meso-thorax also (female). 18. (4.) *collaris*, 2¼ lines (*t*, *s*, *a*).
C. Abdomen marked with red and black, or dark brown (males).
a. Face whitish; legs reddish straw, base whitish.
4. *scutellaris*, 3 lines (*l*, *s*).
b. Orbits white; front legs fulvous, base white; hinder nigro-fuscous, apex of coxæ and of trochanters, white. 14. *troglodytes*, 2½ lines.
c. Face black, coloured as in the female, but with the mesothorax black.
18. *collaris*, 2½ lines (*s*, *l*, *a*).

Section 4.—Scutellum black; abdomen red, or red and black.

A. Hind femora red; apex black; base and apex of hind tibiæ black, remainder red; antennæ tricoloured (females).
a. Coxæ red.
* Hind coxæ armed.
† Abdominal segments, 1st to 4th, red, 1st more or less black; post-petiole shining. - - - 3. (1.) *melanogonus*, 2½—3 lines.
†† Segments, 2nd to 4th or 5th, red; post-petiole finely aciculate.
7. (2. x.) *fulvitarsis*, 3¼ lines.
** Hind coxæ unarmed.
Segments, 2nd to 4th, red; post-petiole shining.
(4.) *formosus*, 3½ lines.
b. Coxæ black.
‡ Segments, 1st to 5th, red; petiole black; tooth on coxæ long.
1. (1.) *semivulpinus*, 3½—4 lines.
‡‡ Segments, 1st to 4th, red; petiole black.
§ Tooth on coxæ moderate. - - 2. (1.) *planifrons*, 3—3½ lines.
§§ Interrupted keel on hind coxæ. - 8. (2. xx.) *ophthalmicus*, 3 lines.
B. Legs red; apex of hind femora and tibiæ black; segments, 2nd and 3rd, and towards the base of the antennæ, red; coxæ with a very minute tooth (female). - - - - 17. *imbellis*, 2¼ lines.
C. Legs red; apex of hind femora and base of hind coxæ dark; antennæ tricoloured* (females).
a. Abdominal segments, 2nd to 4th, red, 5th to 7th red-margined.
10. (3.) *ischiomelinus*, 2½—3 lines (*l*).
b. Segments, 1st to 4th, red. - - 16. (4.) *jucundus*, 3½ lines.
D. Legs red; base of hinder coxæ fuscous (females).
a. Antennæ with a white ring.
* Abdominal segments, 1st to 4th (and margins of 5th to 7th in *ischiomelinus*), red; 1st segment more or less black; apical segment not red marked.
† Hinder coxæ with a small crest.
10. (3.) *ischiomelinus*, 2½—3 lines (*l*).
†† Hinder coxæ unarmed. - - - 15. (4.) *guttulatus*, 3 lines.
** Abdomen red, base black; coxæ with a long tooth.
4. (1.) *scutellaris*, 3½ lines (*s*).
b. Antennæ dark, towards the base red. - (4.) *impiger*, 2½ lines.

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* The antennæ vary much in depth of colouring; sometimes the pale ring is almost wanting.

E. Legs red; coxæ and femora of hinder one black (female).
Antennæ red, white-ringed; abdomen red, 1st segment black. 14. (4.) *troglodytes*, 2½—3 lines (*s*, *l*).
F. Legs entirely red; antennæ and abdomen as in E (female). 14. (4.) *troglodytes*, 2½—3 lines (*s*, *l*).
G. Femora and tibiæ red; hind femora sometimes more or less fuscous, and sometimes the front ones also; hind tibiæ, base black, apex fuscous; coxæ black, front ones often red at the apex (female).
Segments, 2nd to 3rd, red- or black-marked, or apical margins only distinctly or obsoletely red; antennæ red, subannulated. (4.) *suspicax*, 2 lines (*l*, *a*).
H. Femora and tibiæ of front legs red, or partly so; remainder entirely, or nearly all, black (females).
a. Hind coxæ unarmed; middle of abdomen chestnut or reddish.
* Antennæ white-ringed. - - - 12. *cephalotes*, 2¼—4½ lines.
** Antennæ red-ringed. - - - - 13. *acutus*, 2½—3¾ lines.
b. Hind coxæ with a small crest; antennæ dark brown; abdominal segments, 2nd to 3rd, red, with a dark spot in the centre of each. (3.) *nanus*, 2 lines.
c. Hind coxæ with a minute tooth: antennæ dark brown; abdominal segments, 2nd to 3rd and base of 4th, red. (3.) *trepidus*, 2½ lines.
AA. Coxæ black (males).
Abdominal segments, 2nd to 4th or 5th, red, sometimes with black marks (†); legs dark, front ones partly pale, as well as middle of hind tibiæ, and base of femora more or less so.
a. Post-petiole smooth, or faintly aciculate.
* Cheeks dilated below the mandibles; forehead reticulate, with coarse punctures. - - - - 1. *semivulpinus*, 3½—4 lines.
** Cheeks not dilated below the mandibles; forehead shining, with rather fine punctures.
† Face very protuberant. - - - - 3. *melanogonus*, 3 lines.
†† Face not very protuberant. - - - 2. *planifrons*, 3—4 lines.
b. Post-petiole very rugose, and with two keels; segments, 2nd to 4th, castaneous; disk cloudy or black, partly red. 12. *cephalotes*, 3½—4½ lines.
c. Post-petiole entirely punctated.
* Hind tibiæ, towards the middle, piceous or black. 8. *ophthalmicus*, 3 lines.
** Hind tibiæ pale red, also apex of hind femora. 9. *mitigosus*, 2½ lines.
BB. Coxæ not all black (males).
a. All the coxæ red; legs red; apex of hind femora, base and apex of hind tibiæ, red.
* Segments, 1st to 4th, red. - - - 16. *jucundus*, 3½ lines.
** Segments, 2nd to 5th, red. - - - 7. *fulvitarsis*, 3½ lines.
b. Hind coxæ black; front ones pale.
† Middle segments of abdomen red-margined.
‡ Face, or at least the clypeus, yellow. - - *suspicax*, 2 lines.
‡‡ Face black. - - - - - - 17. *imbellis*, 2—2¼ lines.
†† Segments, 2nd to 4th, sometimes with dark marks; 2nd generally so; hind coxæ black, apex pale straw. 10. *ischiomelinus*, 2½—3 lines.
††† Segments, 2nd to 4th and margins of 1st and 5th, greater part of legs, and scape of antennæ, red. - - 11. *conciliator*, 2¼ lines.

P. impiger, Wesm., *P. suspicax*, Wesm., *P. nanus*, Wesm., and *P. trepidus*, Wesm., have been added to the British list since the publication of Mr. Marshall's catalogue, and *P. similis* and *P. formosus* have been described as new (Trans. Ent. Soc. Lond., 1881, pp. 147–149). Several of these smaller and closely-allied Ichneumons are quite common in Britain, but they are generally overlooked, and but little understood in this country; hence we have but little reliable information as to their occurrence and habits. From the following list of hosts, however, it will be noticed that they appear to be more particularly parasitic on the larvæ of the Micro-Lepidoptera. Several species of the genus have been bred from various *Psychidæ*. Brischke is said to have bred a species from *Saperda populnea*, which Ratzeburg doubtfully determined as Wesmael's *P. suspicax* ('Die Ichneumonen,' iii. 167). The host was probably a Tortrix, and the species of parasite is somewhat doubtful (*cf. infra*, host of *P. imbellis*). Vollenhoven has well figured a species belonging to the *semivulpinus* and *melanogonus* group, with the coxal process toothed, in his 'Schetsen' (pt. 1, pl. iii., fig. 16). *P. similis* and *P. formosus* are figured in the Entomological Society's 'Transactions' for 1881 (pl. viii., figs. 4 & 5).

The following British species have been bred:—

1. semivulpinus, *Gr.*,	from	Tortrix rosana; Kawall, Brischke (lævigana). Euchromia rufana (rosetana, *Hb.*); Rondani.
3. melanogonus, *Gmel.*	,,	Œnectra pilleriana; Taschenberg. Depressaria nervosa: Vollenhoven, Fitch Coll.
5. stimulator, *Gr.*	,,	Tortrix viridana; Ratzeburg. Yponomeuta padella; Butler.
14. troglodytes, *Gr.*	,,	Cerostoma?; Voll.
17. imbellis, *Wesm.*	,,	Tortrix pupa in tumid twig of Populus tremula; Brischke. [? Semasia corollana, *Hüb.* (Heegerana, *Wilk.*)]
18. collaris, *Gr.*	,,	Tortrix pupa on oak; Brischke.
19. candidatus, *Gr.*		"e pupa phalænæ"; Gravenhorst. Tortrix viridana; Bignell.

Oiorhinus, *Wesm.*

Abdomen, female, segments 2nd to 4th entirely, 5th to 7th, apex red; male, 2nd to 7th red-margined. Legs red, hind femora to the middle; base and apex of hind tibiæ fuscous; greater part of hind legs of male black. (Male and female.) - *pallipalpis*, 2½ lines.

See Trans. Ent. Soc. Lond., 1881, p. 149.

ÆTHECERUS, *Wesm.*

A. Apex of cheeks behind the mandibles incurved.
Segments 1st to 4th and legs red; apex of hind fomora and tibiæ black; antennæ red, apex black; hind coxæ furnished with a small tooth. (Female.)
Middle of abdomen red or red-banded; front femora and tibiæ, and hind tibiæ, red. (Male.) - - - *nitidus*, 2½—3 lines.
B. Apex of cheeks behind the mandibles straight.
Segments 2nd to 4th, and legs, fulvous; apex of hind femora, base and apex of hind tibiæ, black; antennæ subtricoloured. (Female.)
longulus, 2½ lines.

See Trans. Ent. Soc. Lond., 1881, pp. 149, 150.

ORONOTUS, *Wesm.*

Segments, 1st to 4th, and legs, fulvous; front coxæ and trochanters pale; apex of hind femora, base and apex of hind tibiæ, black; 2nd segment of male with two black marks; antennæ of female slender and white-ringed (male and female).
1. *binotatus*, 3½—4 lines.

Gravenhorst described his single male as a *Phygadeuon*. This species is neither the *Ichneumon binotatus* of Stephens (Ill. Brit. Ent., Mand. vii. 147) nor of Desvignes (Cat. Brit. Ichn., p. 23). Both sexes are beautifully figured by Vollenhoven in 'Pinacographia' (pl. 36, figs. 8, 9 & 9a), where he remarks on the general facies of this rare species having a certain resemblance to an *Anomalon;* its slender, compressed, abdomen reminds one of *Limerodes*. Vollenhoven conjectures that it is parasitic on one of the grass-feeding *Leucaniidæ*.

ISCHNUS, *Grav.*

A. Thorax red, variegated with black and yellow; abdomen black; legs red (male and female). - - 2. *thoracicus*, 2—2½ lines.
B. Thorax not red; scutellum only, sometimes red.
a. Scutellum, legs, and middle of abdomen, red (female).
1. *nigricollis*, 3 lines.
b. Scutellum, legs, apex of hind tibiæ, tarsi and abdomen, black (male).
1. *nigricollis*, 3 lines (*s*, *l*).
c. Scutellum black; 2nd and 3rd segments towards the apical margins at the sides, castaneous; legs red; apex of hind tibiæ and tarsi fuscous (male). - - - - - 3. *rufipes*, 4½ lines.

This genus, as restricted by Wesmael, contains but one Gravenhorstian species (*thoracicus*); it is figured in Vollenhoven's 'Schetsen' (pt. i., pl. i., fig. 3). The British species of *Ischnus* appear to be exclusively parasitic on the larvæ of *Pterophoridæ;* but Dr. Giraud has bred other species from *Talæporia*, *Coleophora*, and *Argyresthia*.

1. nigricollis, *Wesm.*, from Pterophorus (Aciptilia) galactodactylus; Barrett, Porritt.
2. thoracicus, *Gr.* ,, Pterophorus (Mimæseoptilus) phæodactylus; Kaltenbach; P. (Aciptilia) pentadactylus; Brischke, "from larva feeding on the large white-flowering convolvulus, 5th July." Ruthe's Coll., B. M. (? *A. pentadactylus* or *M. monodactylus* (*pterodactylus*), pupa preserved).

HETERISCHNUS, *Wesm.*

Black; legs red; antennæ white-ringed (female).
1. *brevicornis*, 3—3½ lines.

ECTOPIUS, *Wesm.*

Black; spot below the eyes, and base of wings, yellow; stigma fuscous; femora and tibiæ red; extreme margin of 2nd abdominal segment castaneous. (Male.) - - 1. *rubellus*, 3 lines.

The only British specimen we know of this species is that in the National Collection from Stephens' collection, although Gravenhorst says of it, "Mares copiose legi mense Augusto in umbellatis, circa Cudovam."

MICROLEPTES, *Grav.*

Black; legs red (female). - - - 1. *splendidulus*, 2 lines.

This species, originally described from a single female captured at Netley and sent by Hope to Gravenhorst, is well figured in Stephens' Illustrations (Mand. vii., pl. xl., fig. 3), from two specimens taken at Charlton, in August, which are now in the National Collection. It is also figured in Vollenhoven's 'Schetsen' (pt. i., pl. i., fig. 6).

ALOMYIA, *Panz.*

Black; abdomen in the middle, and tibiæ, rufo-testaceous (female, antennæ testaceous-ringed). The abdomen of the male varies much; sometimes it is yellow in the middle, more or less black, or quite black. - - - - 1. *debellator*, 5½—7 lines (*a*).

This single representative of Wesmael's *Ichneumones heterogastri* and of Förster's *Alomyina* is widely distributed, and not uncommon in Britain, but it has never been bred. This variable species is figured by Panzer, Latreille, Curtis, and Vollenhoven.

Since the table of *Ichneumones pneustici* (Entom. xv. 11) was printed, another of Wesmael's genera has been detected as occurring in this country, viz., *Gnathoxys*. The proper place for this genus in the above table is between † and ‡, where ought to be inserted:—

1. Mandibles unidentate. *Gnathoxys*, Wesm.
2. Mandibles bidentate.

GNATHOXYS, *Wesm.*

Black; sides of scutellum (or entirely in a var. of male), line at base of wings, orbits, white; apical margin of abdominal segments reddish; legs red. Male, coxæ and trochanters black. (Male and female.) - - - - - *marginellus*, 2½—3 lines.

A splendid female was captured by Mr. G. C. Bignell on September 24th, 1881, at Plymbridge, near Plymouth.

OBSERVATIONS ON THE HABITS OF ANTS.*

By Sir John Lubbock, Bart., M.P., F.R.S., Pres. Linn. Soc.

Recognition of Relations.

In my previous paper† I have recorded some experiments made with pupæ in order to determine in what manner ants recognise their comrades.

For instance, I separated a nest of *Formica fusca* into two divisions in the spring before the season for laying eggs. Then in the autumn I took ants from one half (which I may call A) and put them into the other half (which I may call B). Thus, of course, there could be no question of individual recognition. Nevertheless, in nine cases such ants were received as friends. This season, again, on the 10th April, 1881, I divided a two-queened nest of *Formica*, leaving a queen in each half. At that time no eggs had yet been laid, and of course there were no larvæ or pupæ. In due course both queens laid eggs, and the young ants were brought up in each half of the nest. I will call the two halves, as before, A and B. On the 15th August, at 9 a.m., I put three of the young ants from A into B, and three from B into A. At 9.30 none are attacked. At 10, the same. At 10.30, the same; one is being cleaned. At 12, the same. At 2 p.m. the same. In fact they seemed quite at home with the other ants. The next morning I was unable to recognise them, the paint having been entirely removed. The ants were all peaceably together in the nest, and there were no dead ones either in the nest or in the outer box. It is evident, therefore, that they had been treated as friends.

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* Concluding Abstract of a Paper read before the Linnean Society, November 17th, 1881, continued from Entom. xv. 56.

† Journ. Linn. Soc. vol. xiv. p. 610.

August 17.—I put in three more from B into A at noon. At 12.30 they were with the other ants. At 1, the same. At 2, the same. At 3, the same. At 5, the same. The following morning I was still able to recognise them, though most of the paint had been removed. They also were evidently treated as part of the community.

Sept. 19.—Put in three more from A into B at 8.30 a.m. I looked at them at intervals of half an hour; but none of them were attacked. Next morning there was no ant outside the nest, nor had any been killed.

Oct. 10.—Put in three more at 7 a.m., and looked at intervals of an hour. They were not attacked, and evidently felt themselves among friends. The next morning I was still able to recognise two. There was no dead ant either in the nest or the outer box.

Lastly, on the 15th Oct., I put in four more at 7 a.m., and watched them all day at short intervals. They exhibited no sign of fear, and were never attacked. In fact, they made themselves quite at home, and were evidently, like the preceding, recognised as friends. For the sake of comparison, at noon I put in a stranger. Her behaviour was in marked contrast. The preceding ants seemed quite at home, walked about peaceably among the other ants, and made no attempt to leave the nest. The stranger, on the contrary, ran uneasily about, started away from any ant she met, and made every effort to get out of the nest. After she had three times escaped, I let her go.

Thus, then, when a nest of *Formica fusca* is divided early in spring, and when there are no young, the ants produced in each half were in twenty-eight cases all received as friends. In no case was there the slightest trace of enmity.

PECULIARITIES OF MANNER IN DIFFERENT SPECIES OF ANTS.

In one of my previous memoirs * I have observed that the behaviour of *Lasius flavus* offered in some respects a surprising contrast to that of *Formica fusca*. In experimenting on the power of recognising friends possessed by these species, I found that while specimens of *Lasius flavus* readily, and even of their own accord, entered other nests of the same species, *Formica fusca*, on the contrary, showed a marked reluctance to do so; and I had some difficulty in inducing them to do so. At that time, however, I did not ascertain what became of the specimens thus introduced into a strange community. I thought it would be worth while to determine this; so I took six ants from one of my nests of *Lasius flavus*, marked them, and introduced them into another nest of the same species. As in the preceding cases, they entered quite readily; but though they were not at first attacked, they were evidently recognised as strangers. The others examined them carefully, and at length they were all driven out of the nest. Their greater readiness to enter a strange nest may perhaps be accounted for by the fact that, as a subterranean species, their instinct always is to conceal themselves underground, whereas *F. fusca*, a hunting species, does not do so, except to enter its own nest.

LONGEVITY OF ANTS.

In my previous paper I have called attention to the considerable age attained by my ants; and I may perhaps be permitted to repeat here, *mutatis mutandis*, a paragraph from my last communication with reference to my most aged specimens, most of those mentioned last year being still alive. One of my nests of *Formica fusca* was brought from the woods in December, 1874. It then contained two queens, both of which are now still alive. I am disposed to think that some of the workers now in the nest were among those originally captured, the mortality after the first few weeks having been but small. This, of course, I cannot prove. The queens, however, are certainly more than seven, and probably more than eight, years old. In the following nests, *viz.* another nest of *F. fusca*, which I brought in on the 6th June,

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* Journ. Linn. Soc.

1875, and one of *Lasius niger* on the 30th November, 1875, there were no queens; and, as already mentioned, no workers have been produced. Those now living are therefore the original ones; and they must be between six and seven years old.

I had also some workers of *Lasius niger*, which I began to observe on the 6th July, 1875; the last of these died on June 15th, 1881; and some of *Formica cinerea* on the 29th November, 1875; the ants in this nest died off somewhat rapidly, the last on July 23rd, 1881. There were no queens in either of these nests.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Argynnis Adippe at Wicken.—Having succeeded in procuring a small house in this village, I devoted the first fortnight of last August to entomologising. Ten years previously I had, under the guidance of Mr. F. D. Wheeler, of Norwich, made my first acquaintance with *Nonagria Helmanni*, *Apamea fibrosa*, and various other fen species. These are so well known to be inhabitants of Wicken Fen that I do not propose to trouble you with a list of even the better species I took. My house was some five hundred yards from the nearest part of the fen; but this did not prevent numerous specimens of *Papilio Machaon* from finding their way to my garden, and among them, much to my surprise, I took on August 1st a specimen of *Argynnis Adippe*. Now anyone who is acquainted with Cambridgeshire knows that no other English county is so destitute of woods; and *A. Adippe*, as far as I know, is entirely a wood insect. I believe I am right in saying that it frequents none but large woods. The only attempt at a wood within moderate reach of the village is a spinney, perhaps one hundred and fifty yards long and fifty wide, chiefly celebrated as producing *Hadena atriplicis* in some quantities. *H. atriplicis*, however, is a species that is widely distributed in the fen-country, whereas *A. Adippe* has, to the best of my knowledge, been recorded from two localities only in Cambridgeshire. From Mr. Skertchley's interesting book on 'The Fenland Past and Present' I learn that it has occurred at Bourn Wood, nine miles west of Cambridge, and that a single specimen was taken at Wisbech in 1876. If the present note should come under the eye of the gentleman who made the

Wisbech capture, perhaps he would favour your readers with some details concerning it. I find, on reference, that Stainton and Newman give no Cambridgeshire localities for the butterfly in question.—GILBERT HENRY RAYNOR; Hereward Hall, Ely, February 20, 1882.

HERMAPHRODITE LYCÆNA ALEXIS.—During August last, a friend who had been collecting for my brother gave him an hermaphrodite specimen of *Lycæna Alexis*, which he had taken near Sturton, in North Notts.—T. GIBBS, JUN.; Bretby, Burton-on-Trent, February 9, 1882.

LARVÆ OF SMERINTHUS OCELLATUS. In August of last year Mr. F. Purchas and I collected upwards of fifty of the larvæ of this moth from the apple-trees in our gardens, which nearly adjoin. The amount of leaf pabulum devoured by them was surprising, and had they been allowed to have remained on the trees they would have quickly stripped them of leaves.—JOSEPH ANDERSON, JUN.; Chichester, March 15, 1882.

LARVÆ OF STAUROPUS FAGI FEEDING ON APPLE.—On the 12th August, 1881, a caterpillar of *Stauropus fagi* about half-grown was found by Mr. Purchas on an apple-tree in his garden. When in captivity I gave it oak and apple, but it greatly preferred the leaves of the latter. In due time it spun up, choosing, however, two oak-leaves for the purpose of enclosing the pupa. I can see that it safely passed into the pupa state, and hope that eventually it will produce a fine imago. I may mention that one of the horns was slightly deformed. Neither Stainton nor Newman mention apple as a food plant; perhaps, therefore, it may be useful to some collectors to know that the larva can be reared on this tree. —JOSEPH ANDERSON, JUN.; Chichester.

NYSSIA HISPIDARIA.—On February 25th I took a good series of *Nyssia hispidaria* in Richmond Park, one specimen being a black variety. I also saw *Amphidasis prodromaria* taken; *Phigalia pilosaria* being common.—J. A. COOPER: 32, Bingfield Street, London, N., March 15, 1882.

EARLY APPEARANCE OF BREPHOS PARTHENIAS.—As an instance of the effect the present extraordinarily mild weather is having upon the emergence of insects, I may mention that I observed *B. parthenias* flying in numbers over the tops of the birch-trees in the woods between Epping and Ongar on the 12th March. I captured a few specimens, some of which had evidently been on the wing some days, and I think the first week in this month may be safely given as the date, this year, of the first appearance of *Brephos* in this locality. On referring to my diary I find my earliest previous capture in past seasons was on the 28th March.—HAROLD CONQUEST; Chingford, March 15, 1882.

DASYCAMPA RUBIGINEA, &c.—This species was taken by me on October 25th. I found it enjoying itself on the ivy-bloom in the garden, in company with *Hoporina croceago* and *Xylina semibrunnea*. In reply to notes from Bournemouth, *Xylophasia polyodon*, *Phlogophora meticulosa* and *Plusia gamma* have been very abundant in this neighbourhood.—T. HOULTON; Hawley, Hants, near Scarborough, January 14, 1882.

EARLY APPEARANCE OF CIDARIA CORYLATA.—On March 12th I captured a specimen of *C. corylata* in very fine condition, in a lane near Child's Hill. This is, I think, very early for this species.—J. RUSSELL; 6. Leverton Street, Kentish Town, N.W.

CHEIMATOBIA BRUMATA.—Mr. Cooke, in his announcement (Entom. xv. 57) of "A Geometer new to Science," seems to base his conclusions principally on the date of capture, judging from the following remarks:—"The species is so much like *C. brumata* that I entertained some doubt about it being a distinct species; but he yesterday (February 7th) visited the spot where he found the larvæ, and captured five males (two just emerged) and one female on grass and posts near the sweet gale. *I think this conclusively proves* that the moth is quite distinct from *C. brumata*, as that species must have been quite over for a full month." I may inform Mr. Cooke that *C. brumata* is generally quite common here right away to the end of January; I have seen specimens—even in a severe winter—in perfect condition in the middle of February; in fact it is often seen quite to the end of that month (February), and odd ones have been taken in the beginning of March.—J. W. CARTER; Bradford, March 14, 1882.

DESCRIPTION OF THE LARVA OF PTEROPHORUS MONODACTYLUS, *Linn.*, = PTERODACTYLUS, *Haw.*—During last summer a young "plume" larva, which proved to be this species, was accidentally brought in with some convolvulus I had gathered for a brood of larvæ of *P. pentadactylus*. By the middle of August it was full-grown, when I described it as follows:—Length, when at rest, about five-eighths of an inch, and stout in proportion. Head polished and rather small, narrower than the 2nd segment. Body uniform and cylindrical, tapering a little posteriorly. Segmental divisions well defined and deeply cut ventrally; each tubercle emits a tuft of short but rather strong hairs. Ground colour bright yellowish green, more decidedly green on the back; head pale yellow, the mandibles light brown. A fine but clear yellowish white line forms the dorsal stripe; there is a much broader stripe of the same colour along the spiracular region, and the space between it and the spiracles is prickled with streaks and spots of the same colour. Spiracles black, hairs greyish. Ventral surface, legs, and prolegs uniformly pale green. The pupa, although attached by the tail only, was laid flat along the top of the cage. It produced a fine imago on September 14th.—GEO. T. PORRITT; Highroyd House, Huddersfield, Feb. 3, 1882.

COLLECTING NEAR COVENTRY.—One afternoon in the woods of Bubbinhall, near Coventry, convinced me that it was a locality by no means to be despised by collectors. In about two hours, besides many more common species, a friend and myself took about half a dozen *Erastria fuscula*, *Phorodesma bajularia*, and *Geometra papilionaria*, which latter was very common. This was in the middle of July, and the weather was all that could be desired.—H. ROWLAND BROWN; Oxhey Grove, Stanmore.

FIXITY OF TENURE BY A MOTH.—For the last three days a specimen of *Tæniocampa gothica* has occurred in a similar position outside one of the window-frames of my dining-room, which has been unoccupied each evening, when presumably the moth was absent on business. To-day it is not there. This habit may be general in the insect world, but I never remember noticing it before; Piepers instances it as a mark of retentive memory in an East Indian butterfly (Entom. x. 270).—EDWARD A. FITCH; Maldon, Essex, March 21, 1882.

FUNGUS GROWING ON DEAD LARVA.—I found on March 11th, about two inches below the surface of the earth, when digging for pupæ at the trunk of an ash near Curraghmore, a lepidopterous larva attacked in a similar manner to that figured in the 'Entomologist,' vol. xi., p. 121. The fungus, which is well developed, appears to be a species of the genus *Torrubia*, as described by

Dr. Buchanan White in the article above quoted. The fungus is somewhat more robust than that figured in 1878, and the larva, of what species I know not, is more contracted and shrivelled.—(Rev.) William W. Flemyng; Portlaw, Co. Waterford, March 13, 1882.

Plectroscelis aridula, *Gyll.*—Whilst staying at Chilham, near Canterbury, in September last, I caught one or two specimens of *Plectroscelis aridula*, Gyll., by sweeping amongst the herbage under hedgerows. At the time I did not recognise the species, or probably I should have been able to obtain many more specimens. Unfortunately I can now only find one of them in my laurel bottle. I hope to get the species again next year, as I believe most *Halticidæ* are generally to be found on their respective food-plants in their localities.—A. Sidney Olliff; 36, Mornington Road, Regent's Park, N.W.

Callistus lunatus, *F.*, **at Reigate.**—It may interest some of your readers to know that, on the 13th of last month, after several unsuccessful visits to Reigate in hopes of finding this beautiful Coleopteron, I at last succeeded in finding its habitat, and captured nine specimens. I have little doubt I should have been enabled to supply a few to friends if allowed to collect a little longer; but, after some few minutes my happiness was somewhat rudely terminated by a pair of the most cantankerous gamekeepers it has ever been my lot to meet with, and whom no amount of persuasion and argument on my part could convince that I was not after the rabbits; and so little did I impress them that they would not leave me until they had walked me nearly a mile away from the spot. This is, I believe, the greatest number of this lovely insect that has been taken at one time since Messrs. Power and Janson collected it in such numbers, now nearly twenty years since.—T. R. Billups; 20, Swiss Villas, Coplestone Road, Peckham, March, 1882.

Ichneumon erythræus, *Gr.*—While searching for Coleoptera at one of my favourite localities in the neighbourhood of Mickleham, on the 22nd of February, I was agreeably surprised to meet once more with the above very beautiful and probably our handsomest species of the British Ichneumonidæ. As I believe this is the first recorded account of its capture, it perhaps will be useful to note the circumstances under which the present insects were taken, the mode being very different to that by which I took the two specimens last summer; one of those was taken on the wing, and the other by sweeping, but both within a few yards of the locality of this year's specimens, which were captured in the following manner:—I was cutting tufts of grass and shaking them over paper for Coleoptera, when to my surprise out fell *Ichneumon erythræus*, Gr. This, to me, was the more remarkable, as the little tufts of grass were growing upon the small mounds of earth raised by *Formica flava* (the small yellow ant). Every piece I cut brought up numbers of the little worker: with these exceptions, there was no other insect to be seen, and although there were numbers of isolated tufts growing around, many of which I cut, I in no case found a single specimen of *I. erythræus*, unless the grass was cut off a hillock of *Formica flava*. Mr. Fitch informs me that there are only two old Stephensian specimens of this insect in the collection at the British Museum, and I believe that nothing whatever is known of its habits or economy; so meeting with this insect under what I think peculiar circumstances may only be accidental; but if it will assist in solving the mystery of its economy, or will help hymenopterists to trace out its habits, my note may not be in vain. — T. R. BILLUPS; 20, Swiss Villas, Coplestone Road, Peckham.

ECONOMY OF CHALCIDIDÆ.—In the 'American Naturalist' for January and February, 1881 (vol. xvi., pp. 60 and 149), Mr. L. O. Howard gives some interesting notes "On some Curious Methods of Pupation among the *Chalcididæ*." He mentions the economy of one of the *Elachistidæ* (*Euplectrus albitrophis* MS) which economises the empty larva-skin of the Tortricid host (*Phoxopteris divisana*, Walk.) into a tent for its separately clustered pupæ. Then the curious pillars supporting the walls of an oak-leaf *Lithocolletis*-mine, as a protection to the single loose pupa of a *Chrysocharis*—one of the *Entedonidæ*. He next alludes to the curious assemblage of black coarctate *Eulophus* pupæ found upon a leaf; these at first sight were taken for the excrement of some lepidopterous larva, and the hairs of the bombycid larval host were taken to be sporidia of some fungus thereon. Last year Mr. Billups gave me similar pupæ of the common *Eulophus ramicornis* bred from *Demas coryli* and *Notodonta camelina*, and I believe he made some interesting notes on their economy.

Mr. Howard mentions an *Astichus* as parasitic in the *Eulophus* pupæ: this is probably an error of determination, as our pretty *Astichus arithmeticus* is undoubtedly a parasite of *Cis,* and not an hyperparasite. The interesting economy of the *Encyrtidæ,* which we know so well in this country, is then adverted to, firstly, the parasitism of *Holcothorax* and its allies on the various leaf-mining *Lithocolletidæ* and other Micros is alluded to, and then the remarkable numbers of *Copidosoma,* whose very numerous, closely packed, cocoons inflate the larvæ of various Lepidoptera. For numerous examples of these Micro-parasitic *Encyrtidæ* I am indebted to Mr. John Sang. I bred the common *Copidosoma truncatellum* last year in immense numbers from a closely-stuffed larva of *Zeuzera æsculi,* sent me by Miss R. M. Sotheby (see Proc. Ent. Soc. Lond. 1881, p. xxi); quite lately Mr. Meldola has given me a naturally-preserved larva of *Thera variata,* with a boxful of its resultant parasites; these also prove to be the common *C. truncatellum.* The year before last, much-distended specimens of *Depressaria nervosa* larvæ, sent to me by Mr. Bignell, produced the closely allied *C. chalconotum.* For the hosts of the numerous *Encyrtidæ,* consult Dr. Mayr's lucid monograph 'Verh. z.-b. Ges. Wien.,' xxv., 675-778. Mr. Howard refers to parasites of this family on a *Lithocolletis,* two *Gelechiæ,* an *Anarsia,* and a *Plusia.* Mr. Pergande counted those bred from one larva of *Plusia brassicæ* to be 2528.—Edward A. Fitch; Maldon, Essex.

Thripidæ wanted.—I am now making a special study of the Thysanoptera, and am much in need of specimens of the described European species. Possibly entomologists, farmers, or gardeners in Britain will kindly collect me specimens, and transmit them to me in small pill- or chip-boxes, numerous specimens of each species with a portion of the plant from which it is obtained in each box. Several of these boxes may be packed in square or other tin boxes, and mailed to me at once. In return I will gradually send specimens, well mounted in balsam, of all such species as in the course of time I may study. These insects are found on almost all kinds of plants, either on their leaves, flowers, or sometimes their fruit; under loose bark of living trees, and under the bark of dead trees or stumps, at all seasons; frequently in hollow stems which were inhabited by other insects; in differen kinds of galls, especially such as are produced by cecidomyideou *flies and Aphides;* also between the leaves of grass, throughou the year. It will thus be seen that they are to be found in a variety of situations: but, to enable correspondents to secure a large number of species, I annex a list of British species, with the plants on which they may be found:—*Phlæothrips ulmi*, under bark of dead elm and other trees; *P. statices*, in flowers of *Armeria maritima; P. pini*, numerous under bark of old pine-stumps; *Heliothrips adonidum* (*hæmorrhoidalis*), in flowers and on leaves in hot-houses; *H. dracænæ*, on leaves of *Dracæna* in hot-houses; *Sericothrips staphyinus*, in flowers of *Ulex europæus; Chirothrips manicata*, on spikes of grass; *Limothrips denticornis*, on heath and grass; *L. cerealium*, very common on grass and cerealia; *Aptinothrips rufa*, in great numbers in spikes of grass and cerealia; *A. nitidula*, on the heads of *Plantago maritima; Thrips ulicis*, in flowers of *Ulex europæus*, *Crocus susianus*, and on corn; *T. phalerata*, in flowers of *Lathyrus pratensis* and *Vicia sativa; T. obscura*, common on wheat; *T. ulmifoliorum*, on leaves of elm; *T. atrata*, in flowers of *Convolvulus soldanella*, *Dianthus*, *Centaurea cyanus*, *Campanulæ*, &c., and especially *Spergula nodosa; T. vulgatissima*, in all kinds of garden flowers, especially *Narcissi* and *Umbelliferæ*, and numerous in flowers of *Sinapis nigra; T. cynorrhodi*, common in flowers of wild roses; *T. glossulariæ*, in gooseberry-flowers; *T. physapus*, in flowers of *Cichoraceæ; T. fuscipennis*, on *Rumex; T. ericæ*, on heath; *T. urticæ*, in flowers of *Nasturtium*, *Thalictrum*, *Ranunculus*, &c.; *T. corymbiferarum*, in flowers of *Corymbiferæ; T. minutissima*, in *Umbelliferæ; T. discolor*, in flowers of *Cruciferæ; T. livida*, in flowers of *Ulex europæus; T. primulæ*, in flowers of primrose; *T. dispar*, on *Festuca fluitans* and other grasses; *T. brevicornis*, on *Festuca fluitans; T. subaptera*, on *Plantago maritima; T. juniperina*, on juniper; *T. variegata*, on flax; *T. pisivora*, on flowers and pods of peas; *T. persicæ*, on diseased leaves of peach; *Belothrips acuminata*, on sand-hills by the sea, probably in flowers of *Galium verum*, *Lathyrus pratensis*, or *Plantago; Melanthrips obesa*, in flowers of *Sinapis nigra*, *Reseda*, and *Ranunculus; Coleothrips fasciata*, in various flowers, especially *Reseda*.—THOMAS PERGANDE; 321, D Street, S.W., Washington (D.C.), U.S A., January 21, 1882.

NOTES FROM CURRENT ENTOMOLOGICAL LITERATURE.

Entomological Anatomy.—There appears in 'Psyche' (vol. iii., No. 87), by Mr. George Dimmock, of Cambridge, Mass., a carefully prepared paper upon the "Anatomy of the Mouth-Parts of the Suctorial apparatus of *Culex*," with a plate illustrating the parts under discussion. This paper is founded upon one, more elaborate, communicated by Mr. Dimmock to the University of Leipzic. Those of our readers who wish to make a nearer acquaintance with the—happily rare in this country—mosquito, will find in Mr. Dimmock's paper much to interest them. The drawings of the anatomical preparations are excellently rendered.

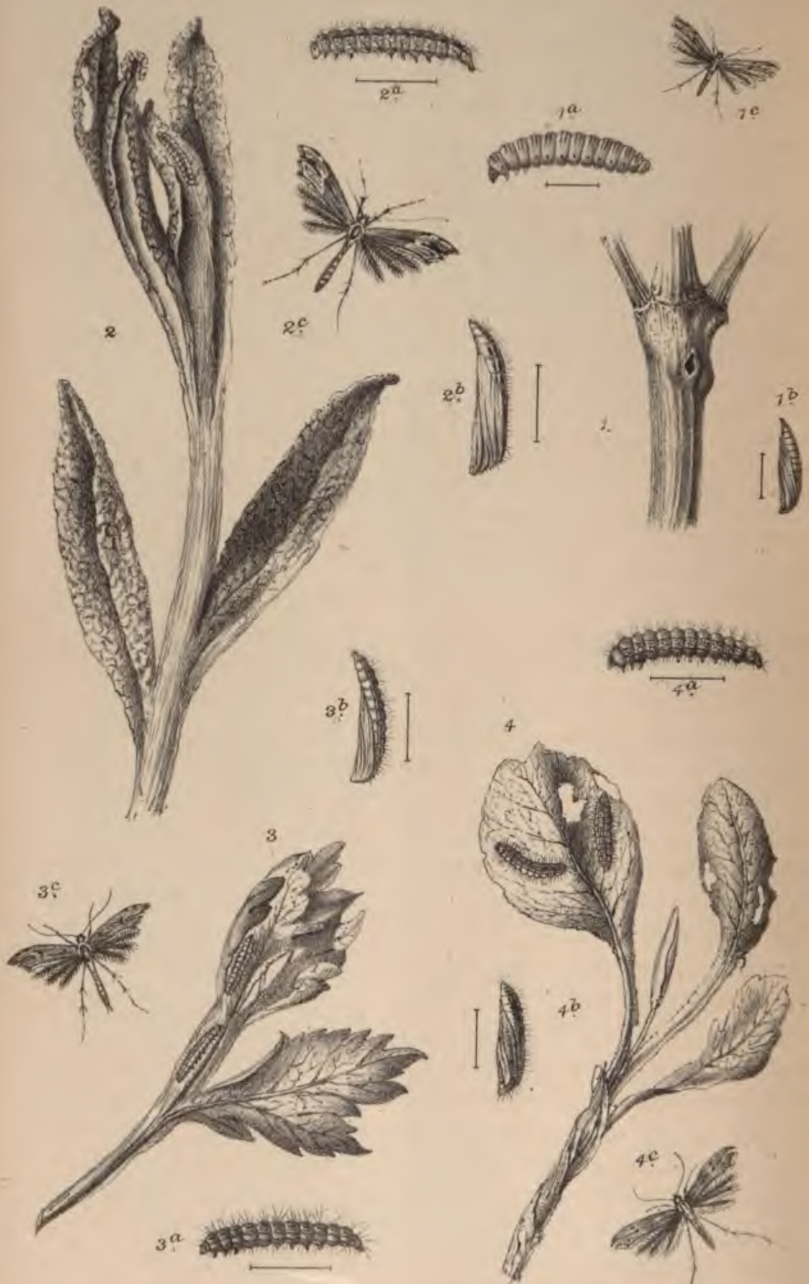
Exotic Lepidoptera.—In the 'Annals and Magazine of Natural History,' (vol. ix., 5th series, p. 84), Mr. Arthur G. Butler, F.L.S., &c., refers to a small collection of Lepidoptera from Melbourne, collected in that part of Australia by Dr. T. P. Lucas. Several of the species described are new to Science. In the same volume of 'Annals and Magazine of Natural History,' p. 206, Mr. Butler also gives the results of an examination of a collection made by Lieut.-Col. C. Swinhoe, chiefly near Candahar. There were forty-one species. Of the ubiquitous *Pyrameis cardui*, Col. Swinhoe says it occurs in the gardens about Candahar in regular swarms in March and April, and in great numbers again in October and November. Mr. Butler notes that the Afghan specimens appear smaller than their European types.

Moths attracted by Falling Water.—Upon this subject Mr. J. Starkie Gardner, writing recently to 'Nature,' (vol. xxv., p. 436), says,—"Whilst watching the great horse-shoe falls of the Skjálfandafljót near Ljósavatn in Iceland, I saw moth after moth fly deliberately into the falling water and disappear. Some which I noticed arriving from a distance fluttered at first deviously, but as they neared the water flew straight in. The gleaming falls seemed at least as attractive as artificial light, and if the fact has not been observed in this country, I should suppose it is because the moths likely to be attracted fly by night, whilst in Northern Iceland there is no night during the summer. The preference trout show for pools near falls is more likely to arise from the extra food they find there than from the more aërated state of the water. The latter supposition, seeing the number of species of lake trout, always seemed to me a lame one, invented for want of a better, whilst the former explains why broken water is always inhabited by insectivorous fishes. The instinct of self-destruction in moths must be older than the introduction of artificial light, and cannot be of use exclusively to collectors, but though its benefits to salmon and trout are obvious enough, its advantages to the moths are not so apparent, unless this self-destruction checks an increase that otherwise would be disadvantageous.

American Ants.—'The Honey Ants of the Garden of the Gods, and the Occident Ants of the American Plains' is the title of a book lately published in Philadelphia (Lippincott & Co.), the author being Henry C. McCook, D.D. The work, which is illustrated by thirteen plates, forms a very valuable contribution to our knowledge of this group of the aculeate Hymenoptera. The importance of Dr. McCook's work deserves more notice than can be given on this page, and those naturalists who have as yet paid little attention to the interesting insects studied by the author, will find much pleasure in perusing his account of these American ants.

J. T. C.

Entomologist. May 1882. Plate 2.



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THE ENTOMOLOGIST.

Vol. XV.] MAY, 1882. [No. 228

CHARLES ROBERT DARWIN.

Obituary Notice.

To write an obituary notice of so great and so well-known a man as the late Mr. Darwin seems to be almost a work of supererogation, but we cannot let his death pass without reminding our readers of some of the work so quietly, yet so successfully, accomplished by him who was at once the most modest, and probably the greatest, naturalist who ever lived.

Mr. Darwin was the son of Robert Waring Darwin, F.R.S., a physician at Shrewsbury, his mother being a daughter of the celebrated Josiah Wedgwood. His grandfather, Dr. Erasmus Darwin, was in his time much celebrated as a scientific worker and poet, he also being a Fellow of the Royal Society. It may be said that the very teaching of descent of Mr. Darwin was exemplified in himself, and that in him was inherited his ancestor's ability and scientific tastes, but to be amplified and strengthened.

The Rev. Dr. Butler, afterwards Bishop of Lichfield, was Mr. Darwin's schoolmaster at Shrewsbury School. Following the example of his grandfather, he went, in 1825, to Edinburgh University. Here he was much interested in marine zoology, and in 1826 read, before the Plinian Society in that city, which was at the time one of the chief literary debating clubs, probably his first scientific paper, on the ova of *Flustra*, one of the Polyzoa. Having left the northern classic city, Mr. Darwin next went to Cambridge, attaching himself to Christ's College, where, in 1831, he took his Bachelor's degree. In those days, when scientific study was of little avail in helping a man towards his university degrees, Mr. Darwin was too much occupied with biological work to obtain distinction in the calendar, but in 1837 he obtained his M.A. In 1877, however, when the former student at Christ's had become the greatest naturalist of the age, Cambridge tardily conferred on him her Honorary Doctorate of Laws.

In his youth, it is said, Mr. Darwin was attached to field sports, fox-hunting among them. It was possibly during this period of outdoor exercise that much of the acute observation of natural objects, which he afterwards developed, had its foundation.

Mr. Darwin's natural modesty made the future intellectual giant, in his early manhood, but little known, and then only to a small circle of friends. They, however, soon discovered his exceptional talents, and when the Hon. Captain, afterwards celebrated Admiral, Fitzroy took command of the surveying vessels, 'Adventure' and 'Beagle,' young Darwin was selected to accompany the latter vessel as naturalist to the expedition, which sailed on the 27th December, 1831. Nor was Mr. Darwin in this work simply a hireling, for he received no remuneration, and even contributed his own share of the expense in the four years' voyage. This was not all, for he amassed fine collections, a great part of which, on his return, he freely gave and distributed amongst those specialists who were interested in various branches of Natural History. The results were published between 1839 and 1842 in official form, but edited by Mr. Darwin himself, with special remarks on the habits of animals from his own pen. In this work he was assisted by Professor Owen, Mr. Bell, Mr. Waterhouse, and others. The country chiefly visited on this voyage was the coast of South America, from Buenos Ayres through the Straits of Magellan to Valparaiso. His observations were, however, much extended, and included the Galapagos, Australia, and many other places visited by the ships in their circumnavigation. As a result of this voyage Mr. Darwin's name will be handed down to posterity in North Australia at Port Darwin, while in Tierra del Fuego are also named after him a mountain and a sound. It was not, however, all happiness with the subject of this memoir during his protracted voyage, for Mr. Darwin suffered almost constantly from sea-sickness, which in his case became chronic, and even in long after years, when far from the rolling billows which had formerly tormented him, his old enemy would return as though he were again at sea. In 1839 was published his account of the expedition, the well-known and even now popular, 'Journal of a Naturalist.' It is needless to refer to that which we suppose has been perused by all our readers.

The first really original work of Mr. Darwin's was published in 1842, being his 'Structure and Distribution of Coral Reefs.' This was followed at intervals by other volumes, all of which are standard works. Amongst these was a paper, soon after his return, 'On the Formation of Vegetable Mould,' from observations commenced some time previously, and these culminated in one of his latest published works on 'Earthworms,' which caused at the time of its issue so much interest, even in circles who take little heed of scientific matters.

The great work amongst the many which have appeared from the industrious mind of this great author, and the one by which he will be best known in posterity, is his 'Origin of Species by means of Natural Selection.' When first issued it was received by many with positive horror, and was generally decried, but happily Mr. Darwin lived long enough to see his masterpiece the accepted doctrine amongst naturalists generally, and his followers, from being counted by tens, to be enumerated by tens of thousands, all over the civilised world. It is impossible to know how far the influence of the train of thought propounded in that volume has extended. New forms and methods of study in Natural Sciences emanated. Students became more methodical, and with a more settled plan in their work. The embryology of various animals has become of the utmost interest, and we may say generally that the teachings of Darwin have directly or indirectly influenced the present system of all scientific work.

To the readers of this magazine some of his works especially appeal, such as his 'Insectivorous Plants,' 'Fertilisation of Orchids,' &c.

After the protracted voyage of discovery, which was the great event in an otherwise quiet life, and which was the cause of a long period of broken health and patient suffering, Mr. Darwin settled at Down, leading the life of a country squire to all outward appearance. He was a magistrate of the county of Kent. Shortly before taking up his residence at Down he married his cousin, Miss Emma Wedgwood, their family consisting of five sons and two daughters. His son, Mr. Francis Darwin, latterly acted as his father's literary secretary and almost constant companion. He also bids fair to continue to a fourth generation that scientific ability which has characterised his ancestors.

In personal habits Mr. Darwin was of the simplest, retiring to rest at ten, and up at five to his beloved work. He seldom left the grounds surrounding his house even for a stroll in the adjoining village. His modesty was such that he never seemed to realise that he had done great or exceptional work. Scientific honours, of course, came thick and numerous. He was a Fellow of the Royal and Linnean Societies, and either honorary or corresponding member of nearly every leading scientific society in the world. He was an original member of the Entomological Society of London. But it seems disappointing that in his own country his ability was never recognised by title or distinction from his sovereign, although, after all, this might have been distasteful to one of such simple tastes.

The Linnean Society is to be congratulated upon having obtained the last, and fortunately the best, portrait of Mr. Darwin, which is painted in oil by Mr. John Collier, and only completed a few weeks ago. It will probably be hung in this year's Academy Exhibition, and is altogether a most pleasing likeness.

Born at Shrewsbury, February 12th, 1809, Mr. Darwin died at his residence at Down, near Beckenham, Kent, April 19th, 1882, in the 74th year of his age. His death was sudden and somewhat unexpected. It was known that he had long suffered from weak action of the heart, but he was engaged at his favourite studies even up to the day before he died, and remained quite conscious up to within a quarter of an hour of the time when he closed his long and memorable life as peacefully as if in sleep. So ended the career of a man who in future generations will be compared with the greatest minds, even to Socrates and the oldest philosophers.

J. T. C.

April 20th, 1882.

P.S.—Since writing the foregoing it has been decided that Mr. Darwin shall be buried in Westminster Abbey, where will ected a funeral of the greatest simplicity. His resting-place will be near to that of another great original thinker, Sir Isaac Newton.

Appended are a few lines from the pen of Mr. J. Jenner Weir.

On April 19th there passed away from amongst us the greatest naturalist that this and probably any century has produced.

The writer of this notice has engaged in the pursuit of Natural History for as many years prior to the appearance of 'The Origin of Species by means of Natural Selection' as have elapsed since that work appeared, and has been profoundly impressed by the totally altered aspect which all the phenomena of Nature have presented to most minds, since by that publication a great flood of light has been thrown on the previously hazy doctrine of the evolution of species. For instance, entomologists had constantly found moths with one or two pollen masses of an orchid firmly glued to the base of their trunks, and insects had been often exhibited at the meetings of the Entomological Society, and, after examination, had been simply pronounced "curious," but no deep significance was attached to the fact.

When Mr. Darwin, in 1862, produced his great work on the 'Fertilisation of Orchids,' it appeared that these curious flowers were so shaped as to give a landing-stage to the insect, and the nectar-tube so arranged that the honey could only be reached by the insect pressing against the pollen masses, and causing them to be fixed to the head or trunk in the exact position they should occupy to effect the fertilisation of the next flower visited. Thus other flowers were discovered that could be fertilised by one species of insect only, as the *Yucca* by *Pronuba yuccasella;* this insect has the legs modified so as to enable it to convey the pollen from one flower to another.

How many Lepidoptera are well known to entomologists, belonging to the same genus or to allied genera, which have almost precisely similar markings; on the doctrine of sphæroid creation these resemblances were inexplicable, but on the theory of a common origin, with modifications brought about by natural selection, no difficulty is presented.

It is not too much to say that Mr. Darwin has, by his contributions *to the* study of Natural Sciences, completely revolutionised research, which will bear fruit so long as that study is pursued.

The writer of this notice is too much affected by the loss he has sustained of the dearest and most esteemed personal friend, and must conclude with an extract from 'The Times' of April 21st, to the truth of which he can amply testify. That paper, speaking of Mr. Darwin, says :—"His habits and manners were of child-like simplicity, his bearing of the most winning geniality, and his modesty and evident unconsciousnesss of his own greatness phenomenal."

CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI*.

By Richard South.

(Continued from p. 31.)

It being impossible to obtain drawings of the life-histories of all the British "plumes" in a single season, such species as have been figured will be dealt with without any attempt to follow the arrangement of our list of the insects in this group. May I again be permitted to ask the assistance of the readers of the 'Entomologist' in obtaining the necessary material for a speedy completion of this series of articles ?

Leioptilus, Wallgn.

Microdactylus, Hub.

(Plate II., Fig. 1.)

Imago.—Expanse, 6–7 lines. Fore wing, ground colour very pale sulphur, sprinkled with blackish scales; a blackish spot on the costa, and a smaller one below it, just before the digital juncture; towards the apex of wing is an indistinct brownish cloud, in which is another small blackish spot; thts latter is not constant. Three minute blackish dots on the hind margin of inner digit. Fringes pale grey. Tip of outer digit acute. Hind wing pale grey, with a pinksih tinge. Head, thorax, and body, pale sulphur. May and June.

Larva.—Length about 4 lines, slightly attenuated towards anal extremity. Head pale brown, with a yellowish tinge; the notched crown is slightly freckled with darker, the mandibles are dark brown or blackish, and there is a black spot on each cheek. Ground colour yellowish white, a series of quadrate patches of brown dots form the dorsal stripe, darker on the 12th and 13th segments. A few short bristles along the dorsal and subdorsal areas; those on the 12th and 13th segments are slightly darker. A row of black dots along the spiracular area, indistinct or altogether wanting on the 3rd and 4th segments. Prolegs tipped with brown, and the upper portion of anal claspers spotted with black. Food, *Eupatorium cannabinum*. Feeds on the flowers.

PUPA.—Dingy yellowish green, the dorsal area slightly darker; upper portion of head blackish, as are also the eyes and anal point of body, which latter is rounded; tip of wing-cases detached.

Plate II., fig. 1, hemp agrimony (*Eupatorium cannatinum*(; 1*a*, larva; 1*b*, pupa: 1*c*, imago of *L. microdactylus*.

The description given is that of the hybernating larva, for a supply of which I have to thank Mr. Eedle. I have not had an opportunity of seeing a *feeding* larva yet.

The larva hybernates in branches or stems of its food-plant, the common hemp agrimony. It makes a hole just below one of the joints, and gnaws it way upwards for about half an inch above the joint; here it prepares a snug chamber, in which it remains as a larva until April, when it turns to a pupa. When, as sometimes happens, a larva pierces the stem *midway* between the joints, a slight thickening of the skin, &c., is observed just above the hole.

ŒDEMATOPHORUS, Wallgn.
Lithodactylus, Tr.
Similidactylus, Dale.

(PLATE II., FIG. 2.)

IMAGO.—Expanse, 12–14 lines. Fore wing whitish grey, sometimes so thickly powdered with brown scales as to appear of a uniform grey-brown colour; freshly disclosed specimens exhibit a slight rosy tinge in certain lights. The costa is narrowly margined with dark brown to just beyond the middle, where is situated a blackish linear spot, from the hinder edge of which a whitish line runs to the middle of the wing, terminating between two blackish spots at the digital juncture; the outer spot situated near the juncture is of small size, and not always clearly defined. In some examples the costal spot and the largest juncture spot are connected by a blackish shade; in such instances the whitish line is hardly to be traced. Tip of outer digit pointed, and very slightly hooked. Fringes grey-brown, with darker scales, more especially at the angle of outer and tip and angle of inner digits. Hind wings dark grey-brown; fringes dark grey. Head and thorax whitish grey. Abdominal juncture whitish. July and August.

Larva.—Length, 6–7 lines, slightly attenuated posteriorly. Head a little smaller than 2nd segment, pale yellowish brown; crown freckled with olive-brown; a black spot on each cheek: mandibles pale reddish brown. Ground colour yellowish green. Dorsal stripe from 4th to 13th segments broad pinkish, its outer edges of a deeper tint, approaching violet, and narrowly bordered with whitish; there is also a yellowish median line, bordered with dark green; this line commences on the 3rd segment. The pinkish dorsal stripe is not assumed until the last moult, but the medio-dorsal line of the adult is present from its earliest stage. Two dorsal rows of tubercles (four on each segment) are situated on the outer edge of dorsal stripe, pinkish, each with a tuft of moderately long pale grey hairs; sub-dorsal, one whitish wart with a tuft of short whitish hairs on the middle of each segment, and a smaller one with a single whitish hair a little below and situated on the posterior edge of segment; spiracular area has two warts on each segment, the anterior of which is semitransparent; it is also larger than its fellow, and the hairs emitted therefrom are longer. All the legs are semitransparent, with a green tinge. Anal claspers tinged with pale brown. Food, *Inula dysenterica*. In the terminal shoots when young, after the manner of a Tortrix larva; later, on the upper surface of the leaves. Occurs in June.

Pupa.—Upper part hairy like the larva, colour whitish, much streaked with dark olive-green laterally; dorsal line whitish, finely bordered with dark grey; wing-cases yellowish green; antennæ and legs showing up darker; a pinkish tinge just above the wing-cases. July.

Plate II., fig. 2, fleabane (*Inula dysenterica*); 2*a*, larva; 2*b*, pupa; 2 *c*, imago of *Œ. lithodactylus.*

When fleabane (*Inula dysenterica*) is making its appearance the unfolding and proper development of some of the shoots, especially terminal ones, appear impeded; examination will in all probability show the check to be due to the presence of young *Œ. lithodactylus* larvæ. This is the best time to secure them, as they are now almost certain to be free from parasites. Later, the larvæ may be found on the upper sides of the expanded leaves, if looked for just after dark. Patches of the fleshy part of the leaf are eaten away, exposing the skeleton, and rendering the plants infested very conspicuous objects. This species is said to feed also upon *Conyza squarrosa* in a like manner.

LEIOPTILUS, Wallgn.

Lienigianus, Zell.

(PLATE II., FIG. 3.)

IMAGO.—Expanse, 9–10 lines. Ground colour of fore wing whitish brown, more or less tinged with ochreous, and sparingly dusted with blackish scales. On the costa are two conspicuous dark brown or blackish linear spots, and at the angle of outer digit is a smaller blackish dot, not always distinct. In close proximity to the digital juncture is a dark brown or blackish linear dash; sometimes this mark is contracted in the middle; between it and the base of the wing is a small blackish dot. Fringes grey-brown; digital margins darker. Tip of outer digit acute. Hind wing grey-brown. Head ochreous brown; thorax and abdominal juncture whitish. July.

LARVA.—Length 5 lines, attenuated towards both ends. Head shining pale greenish brown; mandibles pale reddish brown; crown and spot on each cheek darker brown. Ground colour whitish green; segmental divisions paler. Dorsal stripe narrow, a shade darker than the ground colour, with a very slender whitish median line. Subdorsal stripe narrow interrupted yellowish green. Tubercles, two dorsal rows (two on each segment), whitish, with several moderately long whitish hairs; subdorsal, a row of smaller warts whitish, with two or three short whitish hairs, and situated a little towards anterior edge of segment; spiracular, one wart on each segment, semitransparent, with a greenish tinge; tuft of hair moderately long. Prolegs and anal claspers shining pale greenish brown, with darker brown markings. Food, *Artemisia vulgaris*, on the terminal leaves eating away the fleshy part and leaving the skeleton. May and June.

PUPA.—Whitish green, with a fine yellowish line down the centre of back, and a few oblique dark dorsal markings; warts and hairs similar to those of larva. The oblique markings vary in intensity, sometimes giving the whole dorsal area a brown coloration; wing-cases green; antennæ and legs darker anteriorly. Sometimes the upper part of the pupa is yellowish, with a pink tinge, and the oblique stripes reddish brown. Fixed by tail to under side of leaf of mugwort, the food-plant, looking not unlike the larva at rest. June.

Plate II., fig. 3, mugwort (*Artemisia vulgaris*); 3 *a*, larva; 3 *b*, pupa; 3 *c*, imago of *L. Lienigianus*.

I am indebted to Mr. Sydney Webb for an opportunity of rearing and describing the larva of this local species. Last year, not far from Instowe, North Devon, I met with a large patch of mugwort, when the terminal leaves of many of the plants showed signs of having been fed on in the manner of *L. Lienigianus*, but I did not find the insect in any stage.

LEIOPTILUS, Wallgn.

Tephradactylus, Hub.

(PLATE II., FIG. 4.)

IMAGO.—Expanse, 8–9 lines. Ground colour of fore wing whitish brown, thickly sprinkled with dark grey scales, giving an ashy appearance to the whole wing. Before the digital juncture are two small blackish dots, that nearest the costa being slightly the largest. On the outer digit, near the tip, are three small blackish dots arranged in a triangle. There are also three blackish dots on the hind margin of inner digit. Fringes grey. Tip of outer digit subacute. Hind wing grey-brown; fringes slightly paler. Head and thorax whitish grey. Body pale yellowish grey, with darker dorsal markings. June and July.

LARVA.—Length, 5 lines, attenuated at both ends. Head shining pale yellowish brown: mandibles reddish brown; spot on each cheek black. Ground colour green, with more or less of a yellowish tinge. Dorsal stripe whitish, with a median area darker than ground colour. Subdorsal line wavy interrupted yellowish. Tubercles, dorsal, two rows (four on each segment), whitish, with tufts of whitish hairs; one hair from each of the posterior warts longer than the rest, and the tip slightly reflexed. Subdorsal, a row of small warts each with a single whitish hair. Spiracle region, on the middle of each segment is a semitransparent wart, with a tuft of moderately long whitish hairs: and just above, on the posterior edge of segment, is a smaller one, with short whitish hairs. Legs yellowish green. Food, golden rod (*Solidago virgaurea*), when young, boring into the shoots: afterwards eats holes in the expanded leaves. May and June.

PUPA.—Greenish, with warts and hairs as in larval stage; an olive-green stripe immediately under the dorsal row of tubercles, and under this again is a pinkish shade. Wing-cases pale green, with a lateral fringe of white hairs. Attached by the anal segment, head downwards, to the stems of food-plant or sides of cage in confinement. June and July.

Fig. 4, golden rod (*Solidago virgaurea*): 4*a*, larva: 4*b*, pupa: 4*c*, imago of *L. tephradactylus*.

The imago of *Leioptilus tephradactylus* runs very close to that of *L. Lienigianus* in structure and coloration: but the absence of the costal spots at once separates it from the latter species.

Young hybernated larvæ may be found as soon as the food-plant is above ground, eating the tender shoots, often three or four larvæ on one shoot. They are then about the size of a larva of *Arctia mendica* just emerged from the egg, and in colour whitish, with long grey hairs.

On sunny days the larva rests on the lower part of stem or on a leaf, but on dull days seems to feed at intervals all day.

(To be continued.)

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. III.—OUR GARDENS AND ROADS.

Before proceeding farther afield it will be as well to consider what may be found in our own gardens. Of course this will largely depend upon the sort of garden we possess, its soil, situation, &c.; we may, however, safely say that there is no garden in which rare species may not at one time or other be found. Some rare species, such as *Crioceris merdigera*, which is found in lily-flowers, appear to be confined to gardens; and there are other less rare beetles, such as *Crioceris asparagi*, *Halticæ* of various species, and others which are more or less attached to cultivated plants, that naturally are found in the spots where the plants are grown. Good series, however, of many species may often be taken close to one's own doors; last year, for instance, I took *Meligethes pedicularius* abundantly, and *M. erythropus* occasionally, in the bloom of my strawberry plants. Old trees and stumps in gardens are often very productive. In one garden at Stockwell, some years ago, *Megapenthes sanguinicollis*, *M. lugens*, *Eryx atra*, and *Xylophilus populneus*, all fell in this way to the lot of a fortunate collector. The chief advantage of a garden, however, is the ease and safety with which traps can be set in it. One of the best traps for Coleoptera is a heap of cut grass, which is always forthcoming where there is the smallest piece of lawn. The amount of beetles of all genera to be found in such a heap on a hot day is surprising; and even in winter it is almost always profitable. *Philonthi* and *Homalotæ* literally swarm; and *Oxypodæ*, *Oligotæ*, *Xantholini*, *Steni*, *Euplecti*, *Monotomæ*, *Atomariæ*, *Histeridæ*, *Trichopterygidæ*, *Clambidæ*, and many others are almost equally abundant. The cut grass is perhaps more productive if placed round a hot-bed, if there be one in the garden. From no locality, perhaps, can more species be obtained than from a hot-bed, if worked carefully all the year round. I have chiefly worked hot-beds for *Trichopterygidæ*, and have taken the following from two or three in different localities:—*Trichopteryx atomaria*, *T. lata*, *T. sericans*, *T. Montadoni*, *T. brevis*, *T. anthracina*, *T. longula*, *T. Chevrolati*, *T. rivularis*, *Actidium coarctatum*, *Millidium trisulcatum*, *Nephanes*

Titan, *Ptilium foveolatum*, *Pteridium apicale* (the most abundant beetle at all seasons of the year, the next perhaps being *Acritus minutus*), and one or two other species that may perhaps prove new to Science. This list will serve to show what may be obtained from a hot-bed, as other groups are equally abundant. It is a very good plan to put a little moss in a corner of the hot-bed, and examine it from day to day. It will also be found very productive to examine the under side of the glass some time after the plants have been watered and the frame closed. When the steam has condensed in thick drops on the under surface, a great number of beetles are always flying from the inside of the frame to the light, and get stuck in the water. It is astonishing what large species (*Oxyteli*, &c.) may be found in this way, besides the minuter species. Boards placed round the bed, if examined on hot days, are often found to have good beetles adhering to their under sides. In autumn, when the heat has more or less left the bed, good species may be found in the manure and grass round the edge. I have taken *Philonthus thermarum*, good *Cryptophagi*, and other things, which I have not seen earlier in the year. Even in winter, it is a very rare thing to find a hot-bed wholly unproductive; in fact, sometimes more species may be obtained then than at other times, as the slight warmth left is a great attraction to hybernating Coleoptera. In the warm days of spring these beetles come out in great abundance, and may be seen flying over the manure; and both at this time and in the hot days of summer promiscuous working with the sweeping-net backwards and forwards over the bed will produce many good beetles, the various species of the very rare genus *Euthia* being perhaps the best that have been taken in this way. A list of the species to be procured from grass and hot-beds would take up too much space for our paper, but I can only advise any collector who is studying the minuter groups to leave no frame untouched that he can get access to. Beginners had better not spend too much time over them, as very many of the species are difficult to set properly, and hard to determine; after the experience of a year or two, however, a season almost entirely given up to hot-bed collecting will amply repay any collector.

A very fair collection of beetles for a beginner may be made from pavements, roads, and pathways,; the whiter the better.

Even the most casual observer must have noticed the swarms of insects that are seen glancing about in the sun during the warm days of spring. On examination these will be found to consist of a large proportion of *Amaræ* (chiefly *A. trivialis* and *A. familiaris*), *Philonthi*, and *Xantholini;* but mingled with these will be found many other species, *Cercyons*, *Aphodii*, *Homalotæ*, and many species of *Curculionidæ* being perhaps the commonest. The first beetle to be seen running on every pathway in spring and the last to disappear on the approach of winter is the active little *Notiophilus biguttatus*, which is common everywhere. The *Carabi* are common, but, as they usually roam about in search of prey by night and keep quiet by day, they are generally found crushed by the feet of passers-by. *Pterostichi*, *Harpali*, and *Staphylini* proper are also fond of roads. Of course almost any beetle whatever may be found in such a situation, but some are found so commonly that roads and pavements may be almost considered their peculiar locality. Among these is *Coprophilus striatulus*, which I have never found under any other conditions; it is very abundant on the Lincoln pavement in spring; this year I met with it as early as the 19th of March.

In chalky districts, especially in the south, collectors should keep a sharp look-out for rare species. At Hastings, or Deal, or the neighbouring places, *Calosoma sycophanta*, or even *Diachromus germanus* may at any time fall to their lot. The former beetle has, I believe, been taken not long ago in the streets of Plymouth. *Carabus auratus* may perhaps be picked up in the street outside Covent Garden Market, its claim to being indigenous resting on the fact that it has walked out of a bundle of cabbages or radishes of presumably foreign origin. Sometimes a good species may be taken flying over roads. I remember hearing of *Onthophagus taurus* having been taken by a collector who drove along the roads at dusk, sweeping a net backwards and forwards in the air as he went along. My friend Mr. Mason, of Burton-on-Trent, not long ago knocked a beetle down in the road as he was walking along, which proved to be a fine *Odontæus mobilicornis*. Of course all these captures may with reason be called "accidents"; but it is well to be on the look-out for such "accidents," and to be provided against them: no collector should go unprovided with a small tube or tin match-box, as at any time, when he least expects it, a good species may turn up.

Even in London, good *Staphylinidæ* have been found on the pavements, some of the best in the courtyard of the British Museum itself.

All pools and puddles in roads, especially old ones in deep ruts, should be examined. Mr. J. J. Walker—who did so much for British Coleoptera before he went abroad, and whose liberality was so extensive (for he kept no collection, but sent all his numberless captures to his friends)—once took in a single haul, besides commoner species, the following:—*Homalota hepatica, Anisotoma dubia, A. badia, Cyrtusa pauxilla, Amphicyllis globus, Orobitis cyaneus, Chrysomela varians, Psylliodes dulcamaræ*, and *Mniophila muscorum*.

The School House, Lincoln, April, 1882.

DICRORAMPHA DISTINCTANA, HEIN.

A SPECIES ADDED TO THE BRITISH FAUNA.

By Richard South.

The *Dicrorampha* I captured in North Devonshire last year, and which was figured in vol. xiv. of the 'Entomologist,' Plate I., fig. 15, and referred to at p. 60 of this volume, has been identified by Mr. C. G. Barrett as *D. distinctana* of Heinemann.

This addition to our fauna is interesting, but will add somewhat to the difficulty already existing in the satisfactory identification of the species in this perplexing genus.

Dicrorampha distinctana is nearly allied to *D. consortana*, but may be distinguished therefrom by its larger size, and by the brighter and more clearly defined whitish blotch on the inner margin.

This is evidently a rare species, as Mr. Barrett informs me that it has only been taken by Herr Heinemann near Vienna.

I only met with two specimens; both were taken on the same day early in July, and within a few paces of each other, as they were flying over herbage in the afternoon.

12, Abbey Gardens, St. John's Wood, N.W., April 15, 1882.

BRITISH LEPIDOPTERA.

By John T. Carrington, F.L.S.

I well remember, on my first visit to an entomological society, now well nigh twenty-five years ago, being interested in a somewhat acrid discussion on the merits of the claim of a certain specimen of a lepidopterous insect—*Catocala fraxini* I think was the creature—to be considered "British." Arguments were then briskly used which since that time one has heard so frequently as to place them amongst the group of subjects we are apt to consider "hackneyed."

The cause of my penning these lines was my accidental overhearing a recent conversation between two lepidopterists, of how a certain collector of "British" moths and butterflies had made arrangements for the coming season, to import certain species which are considered rare and therefore valuable if captured in this country. These were to be obtained, in the earlier forms of the various species, from Germany or France, and deliberately passed off as British subjects of her Majesty the Queen. This collector's object, in committing so deliberate and contemptible a fraud, was stated to be, "to bring down the prices of the dealers." Amongst the species enumerated were *Geometra smaragdaria*, *Boletobia fuliginaria*, and—mark the entomological knowledge of our so-called entomologist—*Agrotis Ashworthii!*

Like a certain French gentleman in South Africa, of whom we have heard, on hearing this conversation "I felt sad," and probably for the first time began really to think what would be the effect of the nefarious operations of this self-constituted immigration agent, who, by the way, would not on any account *sell* an insect—if he thought he should be found out.

The question seems to resolve itself into this, that certain Englishmen are in the habit of studying the insular insect fauna of Great Britain and Ireland. Possibly because they have little opportunity of obtaining, and less of observing in a state of nature, the insects from the remainder of the Palæarctic region, so they confine their attentions to the more limited district of their native country. Probably from some points of view this is altogether unscientific, and those who conduct their studies in this manner should be classed with certain collectors known in amateur art circles; but another question arises: Have these gentlemen a right to confine themselves to working out their own fauna? I cannot help thinking that they have not only a perfect right, but that it has been even an advantage to the science of Entomology that this sytem of insular study should be followed, for, at least in this part of the Palæarctic region, the insects are as well known and perhaps better understood than elsewhere in any equal extent of country in the same region, notwithstanding our habit of sending abroad our obscure species to be named. This will probably be considered, by some of the readers of the 'Entomologist,' to be an egotistical statement, but I venture to differ with those who think so. To continue the question of British insect-collecting. As a large number of collectors work a limited fauna, the rarer insects of that fauna naturally soon command a certain market value. As the number of persons interested in the subject increases, so does the value of the particular species most wanted. It is all very well for some people to say that a species is only a species, no matter whence it comes; but for really scientific research it does matter very much if one's specimens from the Shetlands get mixed with those from the Amoor Valley, and we forget which is which. Another reason that certain moths command a larger value than others, is that they are obtained in remote parts of this kingdom by persons who have made it their business to remain in those remote places whole seasons, at considerable expense of time and money, while to most of those who study our beloved science, loss of the former alone makes collecting in such out-of-the-way places impossible. Allowing then, that *bonâ fide* British specimens of certain or all species have a right to certain monetary value, then comes another point of view, *viz.*, to those who have tolerably complete collections of British insects. Many of these have, at great personal cost and in many cases much self-denial, obtained that which, were it a collection of some article of vertu, would be considered amongst a man's estate when he dies, and be realized at a time when his capital is most wanted by his survivors. If we are to permit unprincipled collectors to fraudulently palm off spurious articles upon us, they render our collections only equally valuable with those of the collector who obtains butterflies from all parts of the world, sticks a pin through them, places them in his beautiful cabinet drawers, without even localities or date attached, simply because they are pretty!

As arguments have usually two sides, we will now consider the other part of this question, *viz.*, the more extended study by British entomologists of the whole Palæarctic fauna, of which that of our islands only forms a part. That this more extended study is desirable no one can for a moment deny, and it is even probable that most English entomologists *will* extend their observations to other localities than our own country, as they require other worlds to conquer. Then will the "European" collection increase in value just at the same rate as our British, when there is a market demand for identified specimens required. So far from the dealers being shorn of their profits, they will still have rare insects, and even more valuable local forms, to sell. Now—as the intending student of the Lepidoptera of the Palæarctic region will soon find—certain insects from Siberia or the Amoor command in Paris or Berlin quite as high a price as do any British species in London. Again, it is possible at the present time to obtain for British local forms, or exclusively British species, a higher price in the first-named cities than in our own well-known sale-room near Covent Garden.

It seems to be an uncharitable fashion amongst some people to sneer at "the dealers," while they forget what we owe to those who have made it their business and pleasure to visit corners of this country, which would require the whole of some people's annual holiday to reach and return, without even unfolding the net. How then could we expect to know many local forms recently introduced to us, but for the energy of "dealers?" That there are unprincipled dealers in moths is to be expected, as much as in any other article, but it is for the buyer to use his own judgment as in everything else. I suppose there are still people who intend to make collections and study certain branches of Entomology entirely by their own industrious efforts; but if a man really means to know his subject, he will soon find that his own limited collection is of little use without the aid of exchange, or purchase, to obtain the subjects for comparison.

What I have written will by some be probably considered neither more nor less than heresy, but after all, what is the Entomology of our best entomologists than a mere system of observation, description, and naming of our insects? Who has systematically worked the comparative embryology and probable derivation of our species of insects? Why should *Acronycta* *tridens* and *Acronycta psi*, be so extremely difficult to separate as imagines, but so distinct as larvæ? How many of us know anything of the structure of the ova of insects, or why insects come to sugar one night and not another? No, we are, after all, collectors, only in different degrees.

The time will come, if we keep our insect fauna pure and unmixed, when it will be of great value to naturalists in unravelling the mystery of the great plan of Nature, simply on account of our insular position. Where else in this geographical region can the same extent of locality be found, on which various insects have for countless generations been propagated without admixture of "improving strains"? Even this has been suggested by those who only are fit to breed fancy pigeons, and that we should get European pupæ, and put them down in places where local insects occur, "to improve the breed!"

I think many will agree with me in the opinion, that if a man chooses to study the insect fauna of any particular group of islands, or geographical catchment basin, or even his native county, he has a right to do so; and if any man, directly or indirectly, palms off a specimen which was captured in Kent, upon the student who is working the fauna of Sussex, that man commits a deliberate fraud, and should be treated with the contempt he deserves, if with nothing worse.

Royal Aquarium, Westminster, S.W., April 23, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Funeral of the late Mr. Darwin.—The Abbey of Westminster was this day densely filled, although the admission was strictly by ticket, with those who attended to show their respect to the great man of Science now lying at rest. The coffin, which was of polished oak,—and bore on a plain brass-plate the inscription, "Charles Robert Darwin, born February 12th, 1809; died April 19th, 1882,—was removed from Down to the Abbey precincts last night. At twelve to-day the procession left the Chapter House, the pall-bearers being the Duke of Devonshire, the Duke of Argyll, Mr. J. R. Lowell (the American Minister), Mr. Spottiswoode (President of the Royal Society), Sir Joseph Hooker, Mr. A. R. Wallace, Professor Huxley, Sir John Lubbock

(President of the Linnean Society), and the Rev. Canon Farrar. Immediately followed the chief mourner and members of the family; after which was a procession of great length, including representatives of Foreign States, the Universities, many Scientific Societies; the Speaker, and a number of members of both Houses of Parliament; and some scores of scientific and other leading men. The coffin was laden with beautiful wreaths of flowers, amongst which was notable one of great beauty, tendered to the memory of Mr. Darwin by some members of the Liverpool Scientific Societies, who were represented by Mr. Isaac C. Thompson, of that city. The choral service was rendered, with the addition of an anthem especially composed for the occasion, by Dr. J. F. Bridge, the words being from Proverbs iii. 13, 15, 16, 17. More appropriate lines could hardly have been combined with music in better taste. After the first part of the service, and as the body was being carried to the grave, the day, already gloomy enough, became still more overcast by a passing cloud, which darkness, combined with the solemn music, added much to the impressive solemnity of the scene. At the close of the service the three to four thousand persons present filed past the grave of him who has found a resting-place amidst the remains of those who possessed the greatest intellect born of this country.—JOHN T. CARRINGTON; April 26th, 1882.

VANESSA ANTIOPA IN DECEMBER.—I have received the following communication from Mr. Walter Haydon, surgeon in the service of the Hudson's Bay Company, stationed at Moose Factory in that dreary region:—"One day in December a thaw came on that lasted two days. Whilst I was in the woods setting a trap I saw a *Vanessa Antiopa*, but could not catch it, as I had no net and the bush was thick; it flew up as a tree I had just felled struck the bushes. I am certain of the species, for I saw it settle, but could not get near enough to make a capture." It would therefore appear that the remarkably mild winter we have had has at any rate partially extended to the northern parts of America.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E., April, 1882.

EFFECT OF TEMPERATURE ON LEPIDOPTERA.—On April 10th, when entomologising at Lewes on a sunny bank sloping to the south, I saw several specimens of *Vanessa urticæ* on the wing. The sun rather suddenly became obscured by a passing cloud; one of the specimens in a few minutes became paralysed by the cold, and fluttered on the ground. Upon disturbing the insect it with difficulty rose and attempted to fly across a small stream, but its strength failed, and it fell with outspread wings into the water. The wind was cold and from the east, but the sun when not obscured was very hot. I never in my experience saw the effect of a change of temperature so immediately apparent. On 8th and 10th April several specimens of both sexes of *Pieris rapæ* and *P. napi* were on the wing, an unusually early appearance of these two species.—J. Jenner Weir; 6, Haddo Villas, Blackheath, S.E., April 10, 1882.

The Early Season. — It would appear that the season is unusually forward. I hear *Leucophasia sinapis*, *Notodonta dictæoides*, and *N. chaonia* have already been taken in the New Forest. *Eupithecia irriguata*, *E. dodoneata*, *E. abbreviata*, *F. nanata*, *E. pumilata*, *Boarmia cinctaria*, and *Hemerophila abruptaria* have also been taken, but the time of their appearance is of course more normal.—A. B. Farn: The Dartons, Dartford, April 19th, 1882.

Captures near Romsey.—I may mention that I have taken, during the last two seasons, within a mile of this town, besides numerous commoner species, the following:—*Epione advenaria*, *Eurymene dolabraria*, *Ennomos fuscantaria*, *Boarmia roboraria* and *B. consortaria*, *Camptogramma fluviata*, *Phibalapteryx polygrammata*, *Scotosia undulata*, *Notodonta dictæa*, *N. dictæoides*, *N. trepida*, *N. chaonia*, *N. dodonæa*, *Diphthera Orion*, *Hydræcia petasitis*, a black specimen of *Xylophasia polyodon*, *Luperina cespitis*, *Triphæna subsequa*, *Cirrœdia xerampelina*, *Tethea retusa*, and *Catocala promissa*. — Edward Buckell; Romsey, Hampshire, Nov. 10, 1881.

Note on the female of Phigalia pilosaria.—In the 'Manual' it is stated that the female of *Phigalia pilosaria* is entirely apterous. A careful examination of specimens of the insect I possess leads to the conclusion that the rudiments of wings in this species are at least as well developed as in *Nyssia hispidaria*.—A. E. Hodgson; Coleford, Glos, April, 1882.

Early occurrence of Nyssia zonaria and Bombyx rubi. —On February 12th I took a female of the above moth on the Wallasey sand-hills. It is, I believe, about fifty-three years since I first discovered this species on the Cheshire coast, and I have never heard of it being taken so early. I also picked up some larvæ of *Bombyx rubi*, which I think is also exceptionally early for it to be on the move.—NICHOLAS COOKE; Gorsey Hey, Liscard, February 18, 1882.

DESCRIPTION OF THE LARVA OF GALLERIA CERELLA.—The eggs of this species are deposited in July and August on old honeycomb in deserted or unused bee-hives. The young larvæ when hatched feed on the comb until autumn, by which time they are full-grown. They then spin very tough oval cocoons, which are embedded in the honeycomb, and in that remain without changing to pupæ through the winter, even until the following May or June, when the change takes place. The full-grown larva is nearly an inch long, and rather stout. Body rounded above, rather flattened ventrally. Head narrower than the 2nd segment; it has the lobes rounded, and is, as is also the large frontal plate, slightly polished. Skin soft and rather wrinkled. The ground colour is uniformly a pale dingy brown, appearing darker at the segmental divisions; this appearance caused by the over-lapping of the folds. Head bright sienna-brown; the frontal plate also sienna-brown, but divided in its centre, and also edged in front, with yellowish. Spiracles very minute, dark brown. Ventral surface and prolegs uniformly of a pale yellowish grey; the legs tipped with brown. There are no other noticeable markings. Mr. W. H. B. Fletcher sent me a good supply of these larvæ from the New Forest in the autumn of 1880, from which last year, in July and August, I bred a fine and variable (both as to colour and size) series of imagos.—GEO. T. PORRITT; Highroyd House, Huddersfield, April 4, 1882.

THE PAUCITY OF NEUROPTERISTS.—In his interesting article in the February number of the 'Entomologist' on the "Linnean Order Neuroptera" Mr. King starts with a question as to the paucity of students in this and other orders, which, in a more or less varied form and referring to others of the "neglected orders," has, if I mistake not, been repeatedly asked, but to which I cannot recall having ever seen any attempt at a reply. In venturing to give my own impressions on the subject, perhaps it may be well to premise that my aim in so doing is not by any means to throw cold water on the laudable endeavour being made to enlist more workers in this department of Entomology. On the contrary, I wish to try and help to bring into the light some of the causes of the state of things complained of, with the ulterior view of eliciting any suggestion that can be made towards removing one at least of the contributing causes which appears remediable. Now let us look at the state of things which obtains with the Neuroptera. To go no further afield than Mr. King's paper, we find that the literature bearing on the order is all hidden away in various magazines; that in one group the specimens must be dissected—with the aid of a microscope of course—before the species can be determined; that one or two families cannot be preserved, except in spirits; and so great is the difficulty of naming these, that even an advanced student of the order like Mr. King will not undertake to do so. Some may here be inclined to remark that the difficulties attendant on the pursuit ought to make it all the more attractive; but it must be remembered that we are discussing not things as they should be, but as they are; and I fear that in the vast majority of cases difficulties are not attractive. Minor reasons may possibly be found in the comparatively limited number of species, and in the circumstance that the process of breeding—which affords much interest to many lepidopterists—is not practicable with the Neuroptera. As to collecting this order simultaneously with (say) the Lepidoptera, it has to be borne in mind that the time which most collectors can give to the pursuit is limited, and that not many can go in for several orders with the expectation of making anything like a complete acquaintance with all. I shall not put forward any suggestion of my own as to where any help is to be looked for, beyond saying that it appears to me that a Manual—popular but not unscientific—of British Neueoptera is the first thing needed to increase the number of British Neuropterists. — T. J. Anderson; 24, Florence Place, Glasgow, February, 1882.

REVIEW.

Rhopalocera Malayana: a Description of the Butterflies of the Malay Peninsula. By W. L. Distant. Part I., Royal 4to, 28 pp., 4 coloured plates. London: W. L. Distant, care of West, Newman & Co. Penang: D. Logan, Esq.

When a man, fitted for his work, devotes his best energy in a conscientious manner to any labour, the result should be a masterpiece. Such is the new work of Mr. Distant. Thoughtfully conceived and carefully carried out, Mr. Distant has given us his first instalment of what must become a standard work of reference.

As might be expected, on account of its connection with the mainland of Asia, the insects of the Malay Peninsula belong to many genera which are common to India, and even to the neighbouring parts of the Malay Archipelago, such as Java, Borneo, and Sumatra. This book, then, will be really of necessity to those working the insect fauna of the Indian region generally.

An important feature of the work under notice is the key to the genera, a subject which has been seldom treated, only, we believe, in Doubleday and Hewitson's great work. This latter work is so scarce, expensive, and obsolete, as to make the key given by Mr. Distant of the greatest value.

It is pleasing to find the author is not one of those nomenclators who simply split species, apparently for the pleasure of seeing their own names in brief, after their creations. Mr. Distant has given interesting remarks after finely-divided species, with a view to show that instead of being species such are but local races, &c. The author has been most careful in his acknowledgments of the philosophical literature on the subject, the whole of which he seems to have incorporated in the work: his references are most copious. The chromo-lithographed plates are all that can be desired.

A class work of this kind is a most laborious and expensive undertaking for a private gentleman like Mr. Distant, and is clearly one of those instances where the author should have a small slice of assistance from the fund for the "endowment of scientific research." However, neither trouble nor expense appears to have daunted the author in this case, and we hope he will have the success which he so well deserves.—J. T. C.

OBITUARY.

Henry Moss.—The Lancashire collectors will hear with regret of the death of Henry Moss, which occurred at Oldham, April 17th, after a few weeks' illness, at the age of sixty-four years. He was well known and much respected amongst the older lepidopterists of the neighbourhood, where he will be much missed. —J. T. C.

NOTES ON CURRENT ENTOMOLOGICAL LITERATURE.

Reports of Societies.—The Annual Report of the Entomological Society of the Province of Ontario, Toronto, 1882, is a most satisfactory budget of some 85 pp. and index, printed by order of the Legislative Assembly. This work contains "illustrated reports on the life-history and habits of various insects, prepared by members of the Society for the information of the general public." This being only one of a series of annual reports, the Ontario Society appears to be doing real good, by familiarizing the people with their insect enemies. We are glad to see that in his sketch on "Noxious Insects in England and Canada," the Rev. Mr. Bethune, of Port Hope, gives to our valued correspondent, Miss Ormerod, that credit which is her due, for her 'Manual of Injurious Insects.' The numerous woodcuts in the Ontario Report are fairly executed, but in some instances not printed with that care which would add to the appearance of the book.—In the Report of the Rugby School Natural History Society, 1882, will be found observations on the occurrence of insects, chiefly Lepidoptera. Gratification however, is expressed that the order Coleoptera is receiving attention. Reference is made to the number of desiderata in the Club collection; cannot some of our readers help these gentlemen with a donation of types?

Colonization of Insects.—In the 'Canadian Entomologist' the editor, Mr. William Saunders, mentions (vol. xiv., p. 1) that our European or more strictly English specimens of *Pieris rapæ*, which have settled in Canada, seem to have driven out of the districts colonised, their "American cousins" *Pieris protodice*, which has become quite a scarce insect in some districts. We are not sure that the Canadians are the better for the change, as the former inhabitant of the country was much the prettier insect.

Insect Anatomy.—In the 'Sitzungsberichte der Kaiserlichen Akademie der Wissenchaften' (No. lxxxiii.), Herr von Lendenfeld discusses at length the flight of certain insects, illustrated by seven elaborate coloured and plain plates. This is a very important paper, which deals with the anatomy and physiology of the organs of locomotion of the Libellulidæ. —Mr. V. T. Chambers publishes, under the auspices of the Cincinnati Society of Natural History, an able paper "On the Antennæ and Trophi of Lepidopterous Larvæ." This is one of those carefully-thought-out and written articles which are so conspicuously absent in the Entomological literature of this country. Mr. Chambers states that "the facts and conclusions stated in this paper are the results of observation upon the mouth parts of hundreds of species of *Heterocera* (Macro and Micro), and of a few *Rhopalocera*, and are offered as suggestions to systematists of the Lepidoptera, and may aid somewhat in their classification, especially in that of the *Tineina*," which, says the writer, "is a large group of many families, some of which seem to me to be as far removed from each other in a natural system as they are from any of the *Macro-heterocera*." The author further says, "Mr. Stainton's system . . . . is the best classification of the group with which I am acquainted, . . . and it is with a view to suggesting some amendments to it, not of substituting another for it, that I offer these suggestions." The plates represent a number of mouth parts, which, though somewhat crudely drawn, well illustrate the paper.

J. T. C.

THE ENTOMOLOGIST.

VOL. XV.] JUNE, 1882. [No. 229.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

BY REV. W. W. FOWLER, M.A., F.L.S.

No. IV.—RIVER-BANKS AND FLOOD-REFUSE.

COLLECTING by the river-side depends, of course, to a great extent on the nature of the banks. The smaller rivers and streams have their banks down to the edge clothed so thickly with grass and various vegetation that, although they are often very productive, their productions cannot be discovered without the aid of the sweeping-net, and they must rather be treated of under the head of general sweeping. A good many beetles may often be found by pulling aside the weeds and water-plants, and examining the ground at their roots: some species of *Pterostichi*, *Steni*, &c., are very fond of such habitats close to the water's edge. We must, however, leave these smaller streams, and pass on to the larger rivers, such as the Thames, the Severn, the Trent, the Clyde, and others, that afford long-reaches of sand-bank, shingle, and muddy flats, on which beetles of various species are always to be found in favourable weather, sometimes in the greatest profusion. Different species are to be found on the banks of almost every river, but there is a general similarity —as we should expect—as regards the genera, at any rate.

The most characteristic river-bank genus is, perhaps, *Bembidium;* by far the greater majority of this important genus (which contains nearly fifty British species) are to be found on the banks of rivers and ponds. I have found the following species within a very small area on the banks of the Trent and Dove, near Repton:—*Bembidium æneum*, *B. Mannerheimi*, *B. guttula*, *B. biguttatum*, *B. articulatum*, *B. gilvipes*, *B. lampros*, *B. decorum*, *B. monticola*, *B. tibiale*, *B. atrocæruleum*, *B. littorale*, *B. fluviatile*, *B. flammulatum*, and *B. punctulatum*. Some of these species are to be found among the shingle close to the water's edge. Others are to be found running with great swiftness in the sunshine over mud-flats, in company with *Elaphri* and other beetles; of these, perhaps, *B. paludosum*, which looks like an *Elaphrus* in miniature, is the swiftest: it runs, and even takes to wing, more like a *Cicindela* than any other species. A great number, however, of river-bank beetles live habitually in the cracks and crannies in the banks themselves, and the most effective method of procuring a large number of species is by throwing water (by means of the hands or a small vessel carried for the purpose) against the banks: the beetles, imagining that a flood is coming upon them, by a natural instinct rush to the light, and may be captured in numbers. *Bembidium fluviatile*, *Trechus discus*, *T. micros*, and many other beetles that used to be considered rare, may be obtained in this way in fair abundance. The *Anchomeni* prefer the banks of ponds; but *A. marginatus*, *A. fuliginosus*, and *A. micans* are not uncommon on river-banks, and *A. gracilipes* is to be looked for in similar localities. Species also of the following genera among the *Carabidæ* may be met with:—*Clivina*, *Dyschirius*, *Nebria*, *Chlænius*, *Patrobus*, *Taphria*, *Dichirotrichus*, *Tachypus*; and if we include estuaries, we may add many good species of *Dromius*, *Amara*, *Harpalus*, *Stenolophus*, *Pogonus*, and others. River-banks are usually rich in *Staphylinidæ*; some of the best *Homalotæ* are found in such localities, as may be seen from the following list of species:—*H. currax*, *H. cambrica*, *H. eximia*, *H. fragilis*, *H. longula*, *H. delicatula*, *H. subtilissima*, *H. labilis*, *H. carbonaria*, *H. luridipennis*, *H. hygrotopora*, *H. elongatula*, *H. simillima*, *H. pallens*, H. *aquatica*; *Tachyusa umbratica* and *T. constricta* are also to be found; and many species of *Stenus* (*S. biguttatus*, *S. guttula*, *S. lustrator*, *S. pubescens*, &c.), *Oxytelus*, *Homalium*, *Bledius*, and others; last autumn I turned out *Bledius pallipes* by hundred from the banks of the Severn, near Tewkesbury, by throwing water against them.

Some of the minuter *Staphylinidæ*, such as *Thinobius*, a some of the very rarest of the *Trichopterygia*, such as *Actidiu* are river-bank insects, and ought carefully to be looked for amo shingle or under little heaps of refuse. *Heterocerus*, and *Georyssus* with its curious coating of mud, must not be forgotten, nor must *Cryptohypnus*, among the *Elateridæ*, of which genus one or two species are eagerly sought after by Scotch collectors on river-banks. *Curculionidæ*, too,—for example, *Barynotus*,—may often be turned up under stones near the water's edge, and there are many other species of various genera that often occur: it must, however, be remembered that in windy weather large numbers of beetles are blown into the water, and are carried down until they find their way to the banks, where they remain for some time drying and recovering themselves before starting off afresh.

Before leaving this part of our subject, the river-bank Hemiptera, especially *Salda*, require a passing mention; and the Hydrodromica, *Velia*, *Mesovelia*, *Microvelia*, and *Hydrometra*, though perhaps hardly true bank-insects, cannot well be placed in any other connection.

Beetles can endure immersion in water for a very long period, considering their structure. Nothing surprised the Americans more in the history of the Colorado beetle than the fact that not only rivers proved no obstacle to its progress, but that it even managed to cross Lake Michigan and establish itself firmly on the other side. It is owing to this fact, added to the fact that the hard integuments of beetles are not easily damaged, that makes flood-collecting so profitable.

When a river overflows its banks it seems to sweep all the beetles of the district down with it, and to concentrate them in some few localities: if a river can be watched just as it rises, good species may often be obtained on the spot. Dr. Power once took *Bembidium prasinum* in abundance in this way. When once it has overflowed its banks, the direction of the wind should be noted, and a good collection of refuse and *débris* be gathered from under the railings, hedges, or banks against which it has been drifted. The observation of the wind is important, as anyone who knows the ground will by it be enabled at once to tell where he will find an accumulation. No one who has not tried flood-collecting can have any idea of the enormous quantities of beetles that one bag of rubbish will produce; of course a large majority are very common species, but it is very seldom that a flood does not produce some good ones. I have been very successful in large floods of the Trent, at Repton; in fact, the chief part of my collection as a beginner was made up of beetles taken from these floods: *Philhydridæ*, *Staphylinidæ*, and small *Carabidæ* are most frequent, but beetles of all families may be found. On one occasion at Repton I took *Euplectus minutissimus*, Aubé, in numbers: this beetle is very rare on the Continent, and has never been taken before or since in Britain; but I have no hesitation in saying that it must have been brought down by the flood on that occasion in thousands, to judge from the amount that we found in our bags. I mention this beetle, as showing how likely it is for anyone to find new beetles by this method of collecting; for a flood empties out many localities where a collector would not think of searching, or which perhaps he could not get at.

The refuse should be collected while the flood is still rising, or just as it has reached its height: it is astonishing how soon the beetles make their escape when once it has ebbed and left the rubbish behind; stray specimens of course are left, but these are, as a rule, not worth the carrying home. The most successful flood-collectors of late years have been Messrs. Wilkinson and Lawson, of Scarborough: they generally used to get their refuse from the small mountains and moor-streams, and their takes were astonishing. Most coleopterists will remember Mr. Lawson's capture of some three hundred examples of *Anisotomidæ* and allied groups, comprising representatives of *Hydnobius punctatissimus*, *H. punctatus*, and *H. strigosus*; *Anisotoma rugosa*, *A. dubia*, *A. ovalis*, *A. scita*, *A. lunicollis*, *A. calcarata*, *A. litura*, *A. badia*, and *A. parvula*; and also of *Cyrtusa minuta*, *Liodes orbicularis*, and *Amphycillis globus*.

If anything else were needed to prove that the rejectamenta of small streams, and even of ditches, should never be neglected, we might mention Mr. J. J. Walker's take of *Bagous inceratus*, *B. frit*, and *B. subcarinatus*, from rubbish collected from the sides of a ditch, and Mr. Champion's capture of *Bryoporus* and *Hydroporus celatus* from refuse of Scotch mountain-streams.

In examining the flood-refuse at home the windows should be kept shut, as many species will fly to them and so be easily captured: the examination should be made very carefully, and not hurried over, as the best species often turn up just as one thinks that nothing is left, and is about to throw the rubbish away: the reason of this is that many species curl up their limbs and body, and take a very long time before they stir; and many, too, hide away in the hollow bits of stick and reed that form a very large portion of all flood-refuse. Messrs. Wilkinson and Lawson, I have heard, used to place their rubbish in a sieve, with a bag underneath, and then put a little ammonia amongst it: the beetles immediately rushed away to escape from the fumes, fell into the bag, and so were easily eliminated and captured; I have never tried this plan, but it seems feasible, unless the ammonia should kill the smaller and more delicate species before they could escape. A basin with steep sides is the best vessel in which to examine flood-refuse. If a shallow vessel, such as a dish, is used, a great number of beetles will escape. The rubbish may be kept for a long time, and yet be productive. It is always as full of larvæ as of beetles, and these will breed out and fresh species keep appearing.

Lepidopterists will find flood-collecting by no means unprofitable; for although of course the perfect insect cannot be found, at any rate in any sort of good condition, yet good larvæ may often be discovered not much the worse for their immersion, if it has not been a long one.

The School House, Lincoln, May, 1882.

NOTES FROM GRANGE AND WITHERSLACK.

By Edmund Shuttleworth.

On May 13th, as the weather was promising, I started from Preston by the 8 a.m. train for Grange, where I arrived at about 10 o'clock, when I proceeded to the woods with the intention of doing a little collecting.

The first insect I saw was a *Lycæna Argiolus*, followed shortly afterwards by a second; I saw plenty of them in the course of the morning, but, as their favourite flight is over and around the tops of the highest hollies, they are by no means easy to catch. Upon searching the trunks of sundry old and lichen-covered beech trees I boxed about a dozen specimens of *Nepticula tityrella*, which were sheltering in crevices of the bark on the lee side of the trees; I also kicked up and captured, from among some dwarf hollies growing round the base of the trees, several fine examples of *Nemophora Swammerdamella* and *N. Schwarziella*

Flitting about, in the partial shade afforded by beech and fir trees, were a few *Micropteryx Thunbergella*, affording no clue, however, to the habits of the unknown larvæ; those I took were in fine condition, evidently only just out.

Upon leaving the wood I had to clamber over a loose shingle-wall, at the imminent risk of personal injury. I got over safely, however, and found myself, for the first time this season, face to face with *Nemeobius Lucina*, which, with *Thanaos Tages*, was flying about in the sunshine; a series was soon completed, when I turned my attention to *Ennychia octomaculalis*, but this lively gentleman defied my utmost efforts,—when the sun is really hot this insect *does* fly. Amongst the golden-rod I was fortunate enough to obtain about a dozen fine *Catoptria aspidiscana*, but it was roughish work, as the plant grows on a very slippery limestone formation, evidently the remains of an old glacier, which is traversed in all directions with deep and narrow holes, partially hidden with verdure; and the sensation of having one leg suddenly and by no means gently disappear, while the other one remains stuck out in front, to say nothing of the temporary inconvenience caused by the shock, is not the pleasantest situation in the world. *Eupœcilia ruficiliana* was common among cowslips.

About 12.30 I came upon my friend Mr. Threlfall, and as he was going on to Witherslack I packed up my bag and joined him. Upon our arrival at the "Derby Arms," our head-quarters, we put ourselves in light marching order, and under a blazing sun started off for a row of birch trees growing on the moor about two miles away. We were lucky enough to obtain a few examples of the rare *Nepticula lapponica*, which, I believe, has only been taken in one other locality in England, viz. Scarborough, by the late Mr. Wilkinson. At every step amongst the heather such insects as *Phoxopteryx uncana* and *P. unguicana*, *Clepsis rusticana*, *Gelechia ericetella*, *Elachista Kilmanella* (in swarms), and *Micropteryx Allionella*, started up, and after a short flight of a few yards settled again. Here I made my first acquaintance with *Thecla rubi*, alive and on the wing; and a few minutes afterwards—a lucky back-hander with the net—terminated the somewhat hasty flight of a fine male *Saturnia carpini*. The local little *Primula farinosa*, one of the prettiest of our English flowers, was scattered about in some profusion. When the sun went down a cold breeze sprang up, which prevented any further captures for that day, except that of a pair of *Larentia salicata*, one of which I caught whilst taking a flying jump over a hedge.

We were up again the next morning at 6 o'clock, setting our captures of the day before; this did not detain my friend very long, but kept me without a stop, with the exception of breakfast, hard at work until 12.30, when Mr. Threlfall returned disgusted, having only found six larvæ of *Spilonota lariciana*, where he expected to obtain a quantity. As we dined at 2 o'clock we thought we could not fill up the time better, until that desirable meal was ready, than by collecting the larvæ of *Dicrorampha consortana*, which we accordingly did. For the benefit of those who are unacquainted with the habits of this larva, it draws together the flower-head and leaves of the ox-eye daisy, twisting it up with a most unmistakable care, and feeds concealed therein.

In the afternoon, a strong north-east wind having arisen, we were driven to the only sheltered spot about, viz., at the back of a short range of rocks, where, amongst the heather and golden-rod, we completed a series each of *Catoptria aspidiscana* and *Phoxopteryx unguicana;* besides which, among sorrel (*Rumex acetosella*), *Gelechia velocella* occurred sparingly.

We tried again in the evening for *Larentia salicata*, but the wretchedly cold wind drove us into our inn, where we consoled ourselves with talk of what we might have caught if the weather had been more propitious.

8, Winckley Square, Preston, May 17, 1882.

EFFECTS OF WARMTH AND SURROUNDING ATMOSPHERIC CONDITIONS ON SILKWORM LARVÆ.

By E. A. Ormerod, F.M.S.

The very useful note of your correspondent, Mr. Dobson, regarding effect of heat on *Notodonta dictæa* (Entom. xv. p. 65), suggests that a few observations I made in West Gloucestershire about ten years ago, on effects of temperature and of atmospheric conditions on rate of development of common silkworm larvæ, may be of some little interest; though, at the same time, I rather hesitate to offer them, as, with regard to such a well-observed larva, it may be that every point has already been noted.

The larvæ were received on the 8th of June, and were then about from half to three-quarters of an inch in length; and were divided for experiment into three parties, of which one was placed in a succession vinery of which the air was very damp (the grapes being then at the stage in which the house required frequent syringing); and the temperature was always genial, but variable, as it was raised by sun-heat, but not artificially, excepting occasionally by warm air admitted from the next house. Another party of larvæ was placed in a room of which the window was closed at night, where the temperature was about 60° to 64°; and the remainder in a large garden-loft where the windows and door were open day and night, and the larvæ were consequently exposed to draughts of air and a much lower temperature, the lowest noted being 48°. The rate of growth of the "worms" varied according to the warmth of the air and its general suitableness for their health. On the 17th of June—that is, nine days after they were received—those in the warm and damp vinery were grown, in the most advanced instance, to 2⅜ in.; those in the room to 1¾ in., and those in the draughty loft to about 1⅜ in.; all the larvæ having been treated alike in matters of food. On June 21st the vinery larvæ were 3 in. long, those in the house about 2¼ in., and those in the loft 1⅞ in. By June 23rd numbers of the vinery caterpillars were spinning; of those in the house two began to spin on June 26th, but the mass did not spin for some days later; the caterpillars in the draughty loft did not begin to spin until July 6th.

The worms varied in condition as well as rate of growth, those in the vinery being plump, soft, and warm to the touch, and appearing as if in active brisk enjoyment of their lives; those in the house were firmer and harder; and the loft caterpillars had a cold, dead feel; they all, however, appeared healthy, and I had very few losses—which I conjectured was from the method of feeding; but not understanding silkworm management I cannot say with certainty.

The worms were fed by placing good-sized sprays (about a foot or a foot and a half long), just cut from the mulberry-tree, upright in large pots or boxes (or any convenient receptacle) of earth. The creatures fed eagerly on the leaves, and not having to move about on a defiled surface were thus kept perfectly free from contact with anything that might soil their skins; they had fresh food and fresh air around them, and having constant natural exercise hardly ever required handling, for they were willing to transfer themselves to their new food-shoots.

When I had leisure, I scraped the surface-earth off and threw it away—if I had not time, I dressed it over, and my caterpillars throve; and those in the vinery spun remarkably well. Possibly this matter is so well understood by silkworm rearers that the subject may not have the interest it had then to myself; but to those who wish to rear a few "worms," and have the convenience of a mulberry-tree at hand, I can recommend the plan of feeding as affording a very pretty sight, without the drawbacks of various kinds (and to various senses) attending feeding in trays; and where—as is sometimes the case—a number of caterpillars spin on a single bough, the branch of golden silken cocoons forms a beautiful object for the cabinet or any other purpose.

Dunster Lodge, near Isleworth, March 4, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Colias Edusa and Sphinx convolvuli.—One or two specimens of *Colias Edusa* were captured by me in a clover-field last season; and a fine example of *Sphinx convolvuli*, in the park of D. Henty, Esq., settled on a wooden rail enclosing some fir trees. —Joseph Anderson, jun.; Chichester, April 26, 1882.

Argynnis Adippe *var.* Cleodoxa.—Last March I was fortunate enough to become the possessor of an English *Cleodoxa*, which it may be well to place on record. Mr. T. W. King was kindly allowing me to select from his duplicates any I wanted. Amongst others he gave me what he described as a good variety of *Argynnis Adippe*, and this, on comparison with the figures in Newman's 'British Butterflies,' I at once saw was undoubtedly *Cleodoxa*. The specimen was caught at Sevenoaks, Kent, between 1854 and 1856, and re-set with an entomological pin.—P. Bright; Arnewood, Bournemouth, May 19, 1882.

On the Females of Lycæna Adonis and L. Corydon.—One of the puzzles of Entomology has undoubtedly been how to distinguish accurately from each other the females of these two species. I speak with diffidence, as I possess only three females of *Lycæna Adonis;* but it appears to me that in *L. Adonis* the white of the fringe is much more sharply separated from the black than in *Lycæna Corydon*, and that in the latter the white is decidedly tinged with ochreous, while in *L. Adonis* it is pure white. The dark colour of the fringe, too, is much more decided in *L. Adonis* than in *L. Corydon*, in which it is more of a brown shade. I hope other entomologists of greater experience may be induced to look into this question, and to give the public the results of their observations.—(Rev.) CHAS. F. THORNEWILL; The Soho, Burton-on-Trent, March 3, 1882.

LYCÆNA ARGIOLUS.—On p. 103, vol. vi., of the 'Entomologist,' I recorded the capture of this insect on April 3rd, 1871. I can now give a still earlier date, a friend of mine having captured a specimen on a rosemary bush at Temple Combe, Somerset, on March 24th, 1882.—W. MACMILLAN; Castle Cary, Somerset, April, 1882.

VARIETY OF POLYOMMATUS PHLÆAS.—A variety of *Polyommatus Phlæas* was taken by myself at the end of last July, whilst collecting at Polegate, near Eastbourne. I saw it first on the wing (it appeared unusually dark) as I was working a spot pointed out to me by your correspondent Miss R. M. Sotheby. The variety consists in confluence of spots, which has resulted in a rather distinct crescent-shaped mark on each fore wing.—HAROLD HODGE; Pembroke College, Oxford, Dec. 12, 1881.

VARIETY OF SMERINTHUS TILIÆ.—A fine variety of this species, bred by myself from larvæ found last autumn, emerged from pupa April 23rd last. The colouring is very curious, there being an entire absence of any green. All the markings, which are usually green, are light burnt sienna-red; the usual whitish blotch at the tip of the fore wing is pink; ground colour also pink, in places slightly tinged with grey; under side composed of various shades of light sienna-red and pink; thorax and abdomen also of the same colours.—FRED. W. FROHAWK; Upper Norwood, April, 1882.

EARLY PUPATION OF CHELONIA CAJA.—A mild winter and sunny March invariably produce newspaper reports of early butterflies and spring flowers; but the following fact is more curious than usual. On March 13th, whilst searching a bank with south-west aspect for cases of Coleophora *albitarsella*, I picked up a larva of *Chelonia caja*, which after being in a warm room three days spun up, and changed to pupa on the 20th. When found it did not exceed one inch in length, and was without the long hairs so characteristic of the species when more than half-grown. The pupa, which is rather smaller than that of *Callimorpha dominula*, is suspended in an unusually thin web.—SYDNEY WEBB; 3, Luther Terrace, Dover, March 27, 1882.

RETARDED DEVELOPMENT OF SATURNIA CARPINI.—In the year 1879 I reared a batch of *Saturnia carpini* from eggs. Most of these emerged in due course the following spring (1880). Five took another year to complete their metamorphosis; no unusual occurrence with this species. Expecting no more imagines from my cocoons I deposited them all in a box, and placed them on a shelf in my little room for odds and ends of this sort. On April 28th of the present year I heard a noise proceeding from this box, and on opening found two perfectly developed males. On the following day a female appeared. I was surprised at the lack of gallantry manifested towards her by the former; they ignored her existence. Wanting eggs I exposed her on the heath, thinking that a younger and more ardent generation of males would not be so indifferent to the mature charms of my interesting female; but to my disappointment no free-born male would be induced to bestow any of those delicate attentions which the males are usually so eager to lavish on the fair sex; and after six days of marked neglect she died, without having an opportunity of fulfilling any of the functions of her existence. Is it possible that she had reached a period of life in some way analogous to the aged among the higher animals? It is a well-known fact that some isolated specimens among the *Bombycidæ* pass several years in the pupa state, the delay being attributed to some unfavourable atmospheric condition occurring just at the time of emergence. This does not appear to me a satisfactory explanation of the phenomenon of retarded, or rather suspended, development. Heat naturally existing or artificially applied accelerates emergence up to a certain point, after which it is not only powerless, but actually destructive to life. It is scarcely credible that individuals in a batch of larvæ exposed to precisely the same temperature, and similarly treated in every respect, should have their development arrested for some three or more years *beyond the rest* on any heat theory. Is it not more reasonable to connect the retarded emergence of certain specimens rather with some internal or organic peculiarity of the individuals than surrounding influences?—W. M'Rae; Westbourne House, Bournemouth, May 19, 1882.

Angerona prunaria.—I am breeding *Angerona prunaria.* The first moth appeared on May 9th, which I think is an exceptionally early date.—Thomas Huckett; 200, New North Road, Islington, May 22.

Occurrence of Tephrosia consortaria in London.—I took a fine male specimen of *Tephrosia consortaria* in Bedford Square, Bloomsbury, on May 20th. It was at rest on one of the large sycamore trees, of which there are several fine examples in the Square.—Id.

Stauropus fagi and Notodonta trepida.—Last Saturday I took a fine male *Stauropus fagi* from a beech tree at Black Park; and I have recently bred *Notodonta trepida* from a larva beaten at Abbott's Wood last August.—L. F. Hill; 4, Craven Terrace, Ealing, W., May 14, 1882.

Stauropus fagi.—My *Stauropus fagi* larva, which I mentioned last month as having been found and fed upon apple last autumn, produced, I am pleased to say, a fine male on 24th inst. —Joseph Anderson, jun.; Chichester, April 26, 1882.

Notodonta trepida.—I have had the pleasure of rearing a fine series of *Notodonta trepida*, from larvæ taken last season in Epping Forest.—D. Pratt; 398, Mile End Road, London, E., May 15, 1882.

Acronycta alni in Norfolk.—In July last I found here a larva which answered exactly to the description of *Acronycta alni.* I observed it had a peculiar smell about it, and in the cage it assumed the characteristic bent form of *A. alni.*—R. A. Slipper; The Vicarage, Tuttington, April 6, 1882.

Acronycta alni.—On July 24th, 1881, I started with the hope of a good day's collecting to Sevenoaks; but as soon as I reached my collecting ground there came on a storm of rain, which lasted quite an hour. When the sun came out and had nearly dried the trees, a second storm came, which caused me to consider when the next train would convey me back to London; but the sun shone out again, and I decided to have a look for the larva of *Acronycta alni*. As beating was out of the question, I had been searching the leaves for about half an hour, when I was rewarded with one from birch, and soon afterwards I found one upon oak, which was unfortunately ichneumoned. The first one fed well, and changed to pupa on August 12th, when I accommodated it with a piece of rotten wood, which it entered, leaving no trace of its entrance; and I have now the pleasure to record its appearance as a splendid specimen on May 11th.—D. PRATT; 398, Mile End Road, London, E., May 15, 1882.

CATOCALA NUPTA FEEDING ON PLUM.—On March 25th several larvæ of *Catocala nupta* emerged from eggs in my possession. I at once offered young and tender sprigs of willow, which, as I believe, is the favourite food of these larvæ, but they refused to touch it; as also sallow and a variety of other plants, even lettuce, which I have never known to be refused by other larvæ. I reared a large brood of *Arctia fuliginosa* on lettuce last year. Finally the *Catocala* larvæ chose some leaves of plum, and have continued to feed on these leaves, steadily refusing all other food. As I have never heard, or read, of larvæ of *C. nupta* feeding on plum, I thought it might be useful to others to know these larvæ may be reared on the leaves of that tree.—WILLIAM FINCH, jun.; Arkwright Street, Nottingham, April 4, 1882.

DESCRIPTION OF THE LARVA OF SCOPARIA MURALIS.—During March and April, and even well into May, the larvæ of this species may be collected in abundance by stripping off the moss on old walls in this district. They are found living in silken galleries under the moss, a piece of moss and turf two or three inches long often containing quite a cluster of them. Length about half an inch to a little over, and of average bulk. Head the same width, or perhaps very slightly narrower than the 2nd segment; it has the lobes rounded, and is—as are also the frontal and anal plates—very highly polished. Body cylindrical and of nearly uniform width, tapering only a very little at the extremities. Segmental divisions well-defined, and these, together with the large raised tubercles, give the body a rather wrinkled appearance. Ground colour dingy ochreous-brown, or in some specimens purplish brown, the head and plates intensely black. A fine brown line, widening at the segmental divisions, extends through the centre of the dorsal area; a wavy brown stripe along the subdorsal, and another one along the spiracular region; all these lines together giving a reticulated appearance on the paler ground colour. The tubercles are very dark brown, and are polished, but not so highly as the head and plates. Spiracles black. Ventral surface of the colour of the dorsal area. Having ceased feeding, the larva forms and lines with silk a cavity in the soil at the roots of the moss, in which it changes to a pupa. This is nearly half an inch long, and of ordinary shape and proportions; it is highly polished, and has the abdominal divisions, the eye-, leg-, and wing-cases clearly defined, though not prominent. Colour bright brown, the front of the thorax with an olive tinge; eye-cases darker than the ground colour, and the abdominal divisions chocolate-brown: these dark abdominal divisions, too, show clearly, even through the lower part of the wing-cases. The imagos emerge in June; and from a June moth I one season reared a second brood in August.—Geo. T. Porritt; Highroyd House, Huddersfield, May 9, 1882.

Captures near Leafwood, Sussex.—I have diligently worked this district this spring, and have taken thirty-one varieties of Macro-Lepidoptera, including the following:—*Cymatophora flavicornis*, *Trachea piniperda*, *Tæniocampa rubricosa*, *T. gracilis*, *T. munda*, *Xylina rhizolitha*, *X. petrificata*, *Amphydasis prodromaria* (a long series), *Hemerophila abruptaria*, *Lobophora lobulata*, and *Cidaria psittacata*.—G. R. Ware; Leafwood, Frant, Sussex, March 23, 1882.

Notes on Insects at Sugar.—Subjoined are a few notes on my sugaring experience during the last season. They may be of interest, as showing the effect of prevailing weather on the abundance or otherwise of insects, though I am sorry to say none of the captures mentioned are individually worth noting. May 26.—Close, sultry night, with a breath of wind from the east, and sheet-lightning playing about the horizon. Blank evening; nothing appearing but a solitary *Noctua xanthographa* and three *Gonoptera libatrix*. On a cold, clear night early in June; wind light from S.W., and moon (nearly at the full) shining brightly on the trees, I had a fair attendance of common Noctuæ, as *Grammesia trilinea*, *Agrotis exclamationis*, *A. segetum*, *Noctua plecta*, *Triphæna pronuba*, &c.; I also took *Hadena adusta*. June 21.—Mild night, wind S.W.; Noctuæ scarce, but several

Geometers appeared in plenty. *Cabera pusaria* and *Melanippe montanaria* swarmed at the trees, and were a pest; also *Boarmia rhomboidaria*. I took, too, *Melanippe albicillata* and *Phorodesma dolobraria*. July 1st was an exceedingly hot day; clear night, wind N.E., but very light. Moths very abundant: *Leucania pallens, Xylophasia lithoxylea, X. hepatica, Miania strigilis, G. trilinea, Caradrina blanda, Rusina tenebrosa, A. segetum, A. exclamationis, T. pronuba, N. plecta, N. C-nigrum, N. triangulum, N. brunnea, N. festiva, Euplexia lucipara, Aplecta herbida, A. nebulosa, Hadena dentina, Mania typica*, and one specimen of *Cymatophora ocularis*. The Geometers were best represented (in point of numbers) by *B. rhomboidaria*. I cannot help remarking here—as many others have done lately—on the extraordinary abundance everywhere of *Triphæna pronuba* last season. Many pretty varieties have turned up. In particular, I have taken one with upper wings very pale, and suffused with a faint olive-green tinge; the discoidal spots in contrast dark and clearly defined. July 5th was another scorching day; the evening was clear, with moon shining; wind N.E.; later on it became cloudy, and the wind veered to S. and W. Insects as abundant as on the 1st. I took the same species again, with the addition of *Thyatira derasa* and *T. batis*. July 18th proved a bad night, though the weather promised fairly enough. Nothing came but a few *M. typica* and such-like invaluable species. July 20 and 21.—Weather cool, with N.W. breeze. Both blank nights. Some half-dozen in all of *T. derasa, Apamea oculea*, and *Leucania lithargyria*. July 29.—Wind S.W., sky clear. Another blank night; *Amphipyra pyramidæa* only. August 9.—Weather very unsettled, chilly, with heavy showers at intervals. *A. pyramidæa* abundant; *A. tragopogonis;* took also *Larentia pectinitaria* and *Cidaria silaceata*.—C. CANDLER; Harleston, Norfolk, 1882.

NOTES ON LEPIDOPTERA.—I have to record the capture of two *Bryophila glandifera* on a fence at Portsmouth last July. Being the first time I have heard of its occurrence there, I thought perhaps it might be a new locality for it, and worth noting. I have also to record the capture by myself, on a fence at Roehampton, of a very light variety of *Acronycta psi*, having the fringes of the fore wings, and also the tip of the abdomen, of a beautiful rosy pink colour. I have a *Chelonia caja*, female, bred last season, with the veins all marked with the dark ground colour and carried across all the white spaces; but unfortunately not being at home at the time, it had been flying about and wore away the edges of the wings, or else it would have been a very fine variety. I have bred among my *Arctia menthastri* one specimen having the ground colour of a distinct yellowish cream-colour, exactly the same tint as the blotches in *C. villica*, and another specimen almost as spotless as *A. urticæ*.—H. Sharp; 37, Union Street, Portland Place, London.

Lepidoptera near York.—In the beginning of last August I had the good fortune to receive from a friend a nearly full-fed larva of *Acronycta alni*. It was found feeding on a low crab-tree, and fed for a few days longer. I had supplied it with a piece of decayed wood, which it readily made use of for the purpose of cocooning in. I anxiously await its appearance during the coming season. I am glad to record the capture of *Laverna ochraceella* in this locality. I found one specimen in 1880, and two in 1881, amongst *Epilobium hirsutum*, in the evening, seated on the leaves. —T. Wilson; Holgate, York, April, 1882.

Lepidoptera near Northampton.—Two specimens of *Sphinx convolvuli* were taken by a local collector in a garden on the same evening, while two more were obtained about the same time—the first week in September last—but in a different neighbourhood. Among the Rhopalocera, *Apatura Iris*, *Nemeobius Lucina*, and *Thanaos Tages* deserve notice. Other species, obtained chiefly by entomological members of our Natural History Society, were *Macroglossa fuciformis* and *Sesia apiformis;* whilst *Bombyx quercus*, strange to say, is hardly ever obtained in this neighbourhood, though it can be obtained in plenty in one direction, about nine miles off. *Notodonta chaonia* is rare, as also is *N. dictæa*. A single specimen of *Acronycta alni* was obtained. Other species are *Acronycta auricoma*, *Leucania impura*, *Hydrœcia nictitans*, *Mamestra abjecta*, *Noctua umbrosa*, *Orthosia macilenta*, *Cirrhœdia xerampelina*, *Dicyla oo*, *Aplecta herbida*, *A. occulta*, and *A. advena;* also a single specimen of *Plusia iota*. *Ennomos tiliaria* was rather plentiful. *Phorodesma bajuluria*, and a poor specimen last December of *Larentia multistrigaria;* *Chæsias spartiata*, *Scotosia vetulata*, *Argyresthia Brochella*, *Crambus cerusellus*, and a fine specimen of *Galleria millonella;* other good insects have also been taken. One specimen of Heliophobus *hispida* was taken some time ago at Whittlebury Forest, where also was taken *Leucania littoralis*. Ivy-bloom, although having been searched diligently for several seasons, has proved as yet a thorough failure, hardly an insect being obtained last season, the other years being little better. I obtained on February 11th of this season an interesting aberration of *Phigalia pilosaria*, resting on the trunk of a willow.—Herbert F. Tomalin; 24, York Parade, Northampton, April 26, 1882.

Notes on the Season.—One would have thought that, after the past very exceptionally mild weather, Lepidoptera would have generally been abnormally early, if not abundant. My experience of the last few weeks does not favour either exception. In a recent visit, amongst other localities, to Barnwell Wold and Monks Wood, Huntingdonshire, I have found Lepidoptera decidedly scarce, both in species and numbers. The larva of *Thecla pruni* was taken with really hard beating in the former locality, but we could not find it at Monks Wood. *Hesperia paniscus* appears to have quite died out of both those localities, where it used to occur commonly. We could not hear of its capture in that neighbourhood for several years past. Larvæ, especially the common spring species, appeared plentiful enough, so we must hope for better things as the season advances.—John T. Carrington; Royal Aquarium, Westminster, May, 1882.

Lepidoptera of the Salt-marshes.—During a recent expedition to the salt-marshes, at the mouth of the river Thames, I found the larvæ of the local plume-moth, *Agdistes Bennetii*, at rest in the daytime upon the leaf-stalks of sea lavender (*Statice limonium*). Finding these larvæ in the daylight is about as trying a matter for one's patience as I know, for they get close down towards the roots of the plant, and are just the colour of the leaf-stalk. At night they would probably be much easier to obtain. I have had the pleasure of sending three specimens to Mr. South, who had, I understand, obtained drawings of the larvæ previously, and has now got those of the pupæ, for his plates of the plumes, and so completed the life-history of that species. I also found at the same time a couple of broods of larvæ of *Bombyx castrensis*, but far away from any *Artemesia maritima*, which is said to be the food of this species.—E. G. Meek; 56, Brompton Road, London, S.W., May, 1882.

ATOMARIA LINEARIS A MANGOLD ENEMY.—I send you a brief note of an insect enemy, new to this district, which has attacked the mangold plants which early in the spring were planted for seed. The plants had come up and were growing well, when the young leaves were observed to die off, and become brown and withered. On examination it was found that each withered bunch of leaves contained a number of small beetles. The specimens Mr. E. A. Fitch has kindly sent to Dr. Power, who has confirmed his identification of the species as *Atomaria linearis*, Steph., and he also says in his letter to me:—"Curtis notices it as a mangold enemy in 'Farm Insects,' p. 395. It does not content itself at a later period with attacking the root, but when it is fine weather it comes out of the ground, ascends the stem, and devours the leaves. These little creatures often appear in families on a small plant, of which in a few hours nothing remains but a leafless stalk, which presently withers and dies. M. Bazin first observed this insect in 1839 at Mesnil-St.-Firmin, and some years later M. Macquard stated that it devoured the fields of red beet in the neighbourhood of Lille to such an extent that the cultivators were obliged to replough and resow the fields" (Ann. Soc. Ent. France, 1847). It is difficult to say what is the cause of the sudden appearance, in any particular district, of a destructive insect. In this instance, although mangold-seed has been grown on this farm for upwards of twenty-five years, this little beetle has not been observed to attack the plant until this year. It may, however, have been introduced with the seed, which was from another district; but until the life-history of the species be known it is not possible to say if this could be so or not.—HERBERT FORTESCUE FRYER; The Grove, Chatteris, May 8, 1882.

GALL-MAKING TRYPETIDÆ.—I have lately identified two more British gall-making *Trypetidæ*, by the help of H. Loew's fine work, 'Die Europäischen Bohrfliegen.' The species referred to by Mr. Moncreaff as "reared on September 14th, from galls in the receptacle of *Inula crithmoides;* the receptacle becomes thickened and enlarged, and has a hard woody texture; about seven cells in one flower-head; the larva forms a cocoon" (Entom. v. 450), was named by Mr. Walker "*Tephritis signata*, Meig.," but is, as I suspected, *Myopites inulæ*, v. Roser (*op. cit., p. 65, pl. vi.*, figs. 3, 4). Walker received eight specimens from

Mr. Moncreaff, which are now in the British Museum. Loew says *M. inulæ* is not rare on *Inula* and *Pulicaria* in Central Europe. Schiner bred his *M. Frauenfeldi* from *Inula crithmoides*, but ours is not that species (Fauna Austriaca, Die Fliegen, ii. 142). Also in the National Collection are four specimens of *Urophora macrura*, Loew (*op. cit.*, p. 69; pl. xi., fig. 1), labelled in F. Smith's handwriting, "Bred from galls in the flowers of the common groundsel." Mr. Smith showed me these specimens himself a few years ago, and asked me if I had bred the species; but I quite fail to remember the locality whence they came, if he told me. I am sure, however, they are British. Whether the specimens bred by Frauenfeld from the swollen flower-heads of *Onopordon illyricum* and *Centaurea calcitrapa* are *U. macrura* requires confirmation. Loew says this species is only certainly known from Greece. — EDWARD A. FITCH; Maldon, Essex, March, 1882.

ICHNEUMON ERYTHRÆUS.—In the April number of the 'Entomologist' (Entom. xv. 92) Mr. Billups noted the peculiar propensity of an *Ichneumon* for selecting ant-hills to hybernate in. The insect is *I. sanguinator*, Rossi, not *I. erythræus*, Gr., as there stated. I am responsible for the mistake. Mr. Billups, I think the year before last, sent me an *Ichneumon* to name, and which I believed was a variety of *erythræus;* last year he took another, which he very kindly gave me: and so matters stood, till Mr. Billups made the above discovery this year. I am indebted to my friend Mr. Fitch for the suggestion that Mr. Billups' insects might be *Ichneumon sanguinator*, Rossi, and distinct from *I. erythræus:* a series of the former Mr. Fitch had seen in the British Museum collection,—seven from Desvignes' collection, two from Heysham's, and one from Dr. Power's. Mr. Billups sent me six more of this beautiful little insect, which I found did not vary at all; none had the yellow marks of *erythræus;* and, on referring to the various authors, I believe there is no doubt but that *I. ruficollis*, Stephens, which certainly is Mr. Billups' insect, is the same species which Wesmael described in his 'Tentamen' (p. 102) as *I. discrepator*. I am the more strongly convinced of this because Dr. Capron last week sent me a male *Ichneumon* for my opinion, and which without doubt is the male of *I. discrepator*, Wesm.; and in his letter he said, "Headly Lane is not far from here" *(Shere)*. These two descriptions agree very well with the description of *I. sanguinator*, Rossi, in Gravenhorst's I. E. iii. 918; but as the description is short there must be some doubt about it. *Ichneumon sanguinatorius*, Gr., I. E. i. 295, synonym of *Amblyteles occisorius*, is quite a different species. Probably, on account of the slightly exserted ovipositor, Marshall placed *I. sanguinator* in the genus *Phygadeuon* with *Cryptus sanguinator*, Desvignes, as a synonym, which must be a mistake. Desvignes, in the British Museum Catalogue, gives both *Ichneumon sanguinator* (p. 29) and *Cryptus sanguinator* (p. 58). From the above it is evident that *sanguinator*, Rossi, must be added to Marshall's list. Its place in our table will be (vol. xiii. 216) section 12, B. a.:—

* Thorax and scutellum yellow-marked. - *erythræus*, male and female.
** „ „ not so marked. - - *sanguinator*, female.

The male comes in section 6 (vol. xiii. 181),—A. Abdomen, 2nd to 4th segments red; and after "a.":—

† Antennæ and hind tarsi white-ringed. - *sanguinator*, male, 4½ lines.
†† „ „ not white-ringed.

In structure it might be placed in Holmgren's division 8, if in any of his divisions; it differs from all, but comes nearest to this. It might go into B. of section 7, but for the aciculate 1st segment; this latter mark wants adding to the description of section 8 to make it exact.—J. B. Bridgman; 69, St. Giles' Street, Norwich.

Thryptocera bicolor.—At the end of May or beginning of June last, I had fifty larvæ emerge from a full-fed caterpillar of *Bombyx quercus*. On the 1st May the first imago made its appearance, which proved to be a specimen of this very rare dipteron. Dr. Meade very kindly identified it. Mr. Walker, in his 'Insecta Britannica,' mentions that there was one specimen in Mr. Stephens's collection. Herr Schiner, in the 'Fauna Austriaca,' says he had one specimen which was bred from *Bombyx quercus*, and adds that it has also been bred from *P. mediella*. Dr. Meade, in his letter to me, states that he has one, a German specimen, and that those I sent him are the first British ones he has seen. The larva of *Bombyx quercus* was taken at Falmouth.—G. C. Bignell; Stonehouse, May 5, 1882.

Note on Parasitic Diptera.—It seems that occasionally flies which are not usually parasitic in their habits become so under particular circumstances, or in certain localities. The causes of this peculiarity are very obscure, and the fact is very interesting; so that any well-authenticated instance is worth recording. In

March last, Professor C. V. Riley (State Entomologist), of Washington, U. S., sent me some *Muscidæ* which he said were enemies (parasites) of the cotton-worm (*Aletia argillacea*, Hübner). I found that they were specimens of the common *Cyrtoneura stabulans*, Fallen, a fly which is generally distributed over Europe and North America, and has also been found in New Zealand, according to Schiner. The larvæ of this Muscid are said to live generally on fungi, but probably also eat all kinds of decaying vegetable matter, and also manure; for, as their name imports, they often abound in stable-yards. In the 'Fauna Austriaca,' Schiner adds that, according to Hartig and Bremi, they also prey upon the larvæ of butterflies and bees.—R. H. MEADE; Bradford, May 15, 1882.

APPOINTMENT OF CONSULTING ENTOMOLOGIST.—We have great pleasure in announcing that the Royal Agricultural Society of Great Britain has appointed our valued correspondent, Miss Eleanor Ormerod, to be consulting entomologist to that Society. The committee of the Royal Agricultural Society is to be congratulated upon its selection; as is also Miss Ormerod upon her further opportunity for the development of the generally neglected study of Economic Entomology. We understand that, at the express desire of Miss Ormerod, the post has been made honorary.—J. T. C.

OBITUARY.

BEEBEE BOWMAN LABREY.—Mr. Labrey was born June 30th, 1817, at Liverpool; and when about six weeks old was taken to Allonby, in Cumberland, where he stayed till he was about the age of nine. He was then brought to Manchester, where his father lived; and eventually was sent to York School, where so many of our older naturalists have been educated. He was fairly acquainted with various branches of Natural History, but Entomology received his greatest attention; and for some years before his death he had been working out and drawing the plumules found on some families of butterflies; and he has left behind manuscripts and figures which he was intending to have published if he had lived. Two years ago he had the misfortune to have his manuscripts stolen from the railway carriage when on his way to London, and he had to re-write and figure the whole work, which he was able to do from the original specimens of plumules which he had mounted for the microscope. He was very thorough and conscientious in all the work that he did, and he had a great facility not only for drawing, but for learning languages, several of which he spoke and wrote fluently. He was modest and retiring in his nature, though ever ready and eager to encourage and assist the young. He died from the effects of suppressed gout on April 26th, at his country cottage at Disley, Cheshire, and was buried in the churchyard of that place on April 29th. He was a man deservedly respected by all who knew him, as was shown by the number of friends who attended his funeral, many coming from long distances notwithstanding the weather, which was exceptionally stormy.—J. F.

ERRATA.—In the remarks made in the 'Entomologist,' p. 50 of this volume, on plate I., figs. 2 and 2*a*, I find that an error has been committed in the name of the insect figured. I have seen Mr. Ashmead, and he informs me that the insect in question was caught by himself on July 9th, 1881, in company with large numbers of *Argynnis Adippe*, and that he entertains no doubt but that it is of that species, a view in which I fully concur. In the obituary notice of the late Mr. Darwin, p. 101, line 6 from bottom, *for* "spheroid" *read* "special."—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E., April 29, 1882.

Thripidæ (Entom. xv. 95).—Mr. Pergande's name should be "Theodor," *not* "Thomas."—E. A. F.

REVIEW.

The Student's List of British Coleoptera. Compiled by FRANCIS P. PASCOE. London: Taylor & Francis. 1882.

THIS small volume of 120 foolscap octavo pages might well have been entitled "A Handbook to the Classification of British Coleoptera," since its utility is likely to be far beyond that of the conventional "List." It contains a synopsis of the families of our British Coleoptera arranged in a dichotomous table, followed by similar tables of the genera, with a list of the British species. Mr. Pascoe commences with the *Coccinellidæ* and the other *Trimera*, following with the *Tetramera*, *Heteromera*, and *Pentamera*, and concludes with the *Cicindelidæ;* thus reversing the general order. The great labour spent in the compilation of these synoptic tables is evident when we consider that there are

207 divisions in the table of genera of the *Staphylinidæ*, 171 in the *Curculionidæ*, &c. Happily the list is not crowded with synonyms; the few necessary citations are, we are told in the preface, from a comparison of Gemminger and Harold's Catalogue with that of Stein and Weise. This gives a good working basis, but we can quite understand that Mr. Pascoe's views on the vexed question of nomenclature will not find favour with extreme "resurrectionists"; when a name has survived without interruption for the last fifty years or so, it has been adopted, Mr. Pascoe having no sympathy with those who would resuscitate a name "supposed to be used in the dark ages of systematic Entomology." In this we think he has used a very wise discretion. He further says—"For myself, I decline to be bound by any absolute rule. When the name is barbarous, or absurd, or the very opposite of the character it ought to express, I take any better name, whatever its claims to priority may be"; and then in a few short paragraphs well illustrates the confusion likely to arise from a strict adherence to the law of priority. With regard to this list of species, we can but express the wish that more minute research had been made into our periodical literature. Of the fifty-nine species to be added to Dr. Sharp's Catalogue (1871), enumerated by Dr. Power at Entom. xi. 62—69, thirty-six are omitted; four of these are admittedly accidental occurrences, and perhaps one or two others may be introduced species. *Harpalus oblongiusculus*, Dej. (Ent. Mo. Mag. xv. 203), and *Latheticus oryzæ*, C. O. Waterh. (Ann. Mag. Nat. Hist. 1880, p. 148, and Entom. xiii. 210), an introduced but at least partially naturalised species, are also omitted.

This 'Student's List' will be almost indispensable to the now too-few workers at our British Coleoptera, and will be of great service to the general entomologist. All are indebted to Mr. Pascoe for its compilation. We trust that he, or some equally competent specialist, may find the time to complete the work so ably commenced, by supplying tables of the species. This by no means light task has already been commenced by the Rev. T. Blackburn in his 'Outline Descriptions of British Coleoptera,' running through eight numbers of the third volume of the 'Scottish Naturalist' (1875—6); a reference would greatly help to Reitter's "Bestimmungs-Tabellen der europäischen Coleopteren," now appearing in the Vienna 'Verhandlungen.'—E. A. F.

NOTES ON CURRENT ENTOMOLOGICAL LITERATURE.

Economic Entomology.—'The Planters' Gazette,' a fortnightly paper devoted to the colonial interests, contains in its issue of April 15th (vol. xxiii., p. 100) an article on "Phylloxera: its History and Results." The object of this communication seems to be intended as a consolation for the coffee-planters of Ceylon and South India, for their losses by the ravages of *Hymellia*, etc., by pointing out the enormous losses suffered by the grape-growers of Europe. A concise life-history of *Phylloxera* is given, which will be of use to colonists who grow grapes. The introduction of new stock vines from other countries is discussed, especially those from America. "It seems remarkable," says the writer, "that whilst France has been deciding in favour of American vines, the Swiss authorities have been visiting every man's vineyard, and rooting up every American plant they could find." Stamping out, by cutting down and burning the vines root and branch, seems to be the only remedy against their enemy that the wine-growers have yet discovered.

Professor C. V. Riley, in the entomological columns of 'The American Naturalist' (May, 1882), as usual, has a choice little entomological *pot pourri* for his readers. He or his contributors have, among others, notes on "Carnivorous Habits of *Microcentrus retinervis*, a locust feeding on beetles;" "First Insect from Wrangell Island," a spider and a larva, the former having proved an undescribed species of *Erigone*, the latter being probably lepidopterous; "Injurious Insects in California;" notes on their extermination by the executive officer, &c.

Insects Injurious to Forest and Shade Trees.—The Department of the United States Entomological Commission issues another of the bulletins (No. 7), devoted to the above subject, which is too important a work to receive sufficient notice on this page, and will probably be referred to more fully next month.

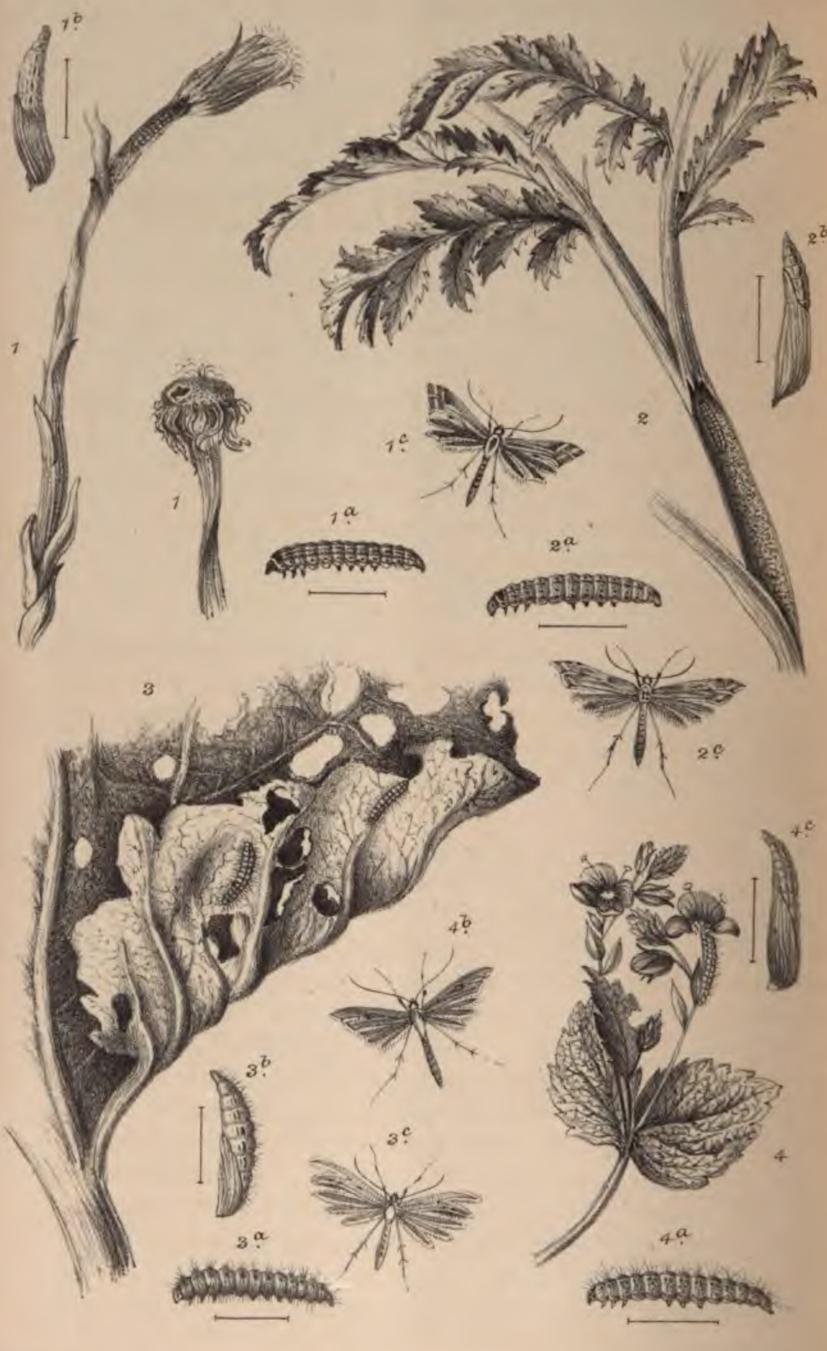
Practical Entomology.—Professor J. Henry Comstock has issued a fragment of a 'Guide to Practical Work in Elementary Entomology' (Ithaca, New York: 1882), which he describes as "an outline for the use of students in the entomological laboratory of Cornell University." If Professor Comstock means this as an instalment only of a larger book, we wish he may soon find time to complete it. Nevertheless this is a useful little work, which will be found handy on the work-table of even some of the older entomologists. In his next issue, students would benefit by small woodcuts illustrating the meaning of some of the anatomical parts described.

Entomology in New Zealand.—In the new publication, 'The New Zealand Journal of Science' (Dunedin: Wilkie & Co.), is a paper on the Micro-lepidoptera of that country. The first part appeared in No. 1, February, 1882.

Exotic Insects.—Mr. H. W. Bates, F.R.S., in 'Annals and Magazine' (vol. ix., 5th Series, p. 319), describes "New Species of Geodephagous Coleoptera from North-West Mexico. Mr. Charles O. Waterhouse, in the same volume (p. 321), gives "Descriptions of Cetoniidæ, Buprestidæ, and Cerambycidæ from Madagascar." Again (p. 396), Mr. Distant describes *two new Malay* Rhopalocera from the Malay Peninsula.

J. T. C.

Entomologist July 1882. Plate 3.



West, Newman & Co. del. ad nat. et lith.

THE ENTOMOLOGIST.

Vol. XV.] JULY, 1882. [No. 230.

CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI.*

By Richard South.

(Continued from p. 106.)

Platyptilia trigonodactylus.

(Plate III., Fig. 1.)

In again referring to the life-history of *P. trigonodactylus*, which will be found ante (p. 31), I will add a few additional notes confirmed by recent observation. The young larva feeds in the shoots of its food-plant (*Tussilago farfara*), until the flower-heads are thrown up; then these are attacked. Sometimes the larva will crawl up the outside of a flower-stem and enter the head just above the receptacle, but more often it ascends by way of the interior. In this latter case it does not feed *in* the stem, but makes its way direct to the head. When nearly full fed the larva generally enters a head which has passed or is about to pass into the fruiting stage. It then proceeds to arrest the ripening process by eating away the inner fleshy part of the stem a little below the receptacle. This causes the head to droop until it comes in contact with the scape, against which it hangs in such a manner as to attract the attention of anyone hunting for the larva. When full fed it makes a chamber among the seed down, and enters the pupa state. In causing its domicile to become inverted, the larva not only secures its food in a palatable form, but exhibits wonderful foresight in providing a weather-tight apartment for its pupal condition.

Plate III., fig. 1, coltsfoot (*Tussilago farfara*); 1 *a*, larva; 1 *b*, pupa; 1 *c*, imago of *Platyptilia trigonodactylus*.

PLATYPTILIA, Hub.

Dichrodactylus, Muhlig.

(PLATE III., FIG. 2.)

IMAGO.—Expanse, 12–14 lines. Ground colour or fore wing whitish ochreous, much clouded with cinnamon-brown. The costa is narrowly dotted with dark brown to beyond the middle, where is situated a narrow dark brown linear spot; beyond this the edge of costa is yellowish ochreous, broken by another dark brown spot of variable size and intensity; a small dark brown spot at the digital juncture, and the fissure and hind margins of both digits are outlined with dark brown. Fringes slightly paler shade of ground colour; a tuft of brownish scales at the angle of inner digit, and a smaller tuft on the inner margin. Tip of outer digit produced and slightly falcate. Hind wing, 1st and 2nd feathers brown with a faint purple tinge, fringes paler; shaft of 3rd feather pale ochreous; fringe whitish ochreous at the base and grey towards the edge. Head, thorax and abdominal juncture whitish ochreous. Hind legs whitish, with three brown patches, one small and one large on the tibiæ, and a small one on the tarsi. These markings are only to be observed in *bred* or fresh-caught examples. July.

LARVA.—Length 8 lines, slightly attenuated posteriorly. Head yellowish green, with brownish mandibles, and a black spot on each cheek. Ground colour green. Dorsal stripe whitish, broken at the segmental divisions; a median line of the ground colour is intersected by the darker alimentary canal. Subdorsal and spiracular lines whitish, interrupted at the segmental divisions. Tubercles inconspicuous; dorsal, two rows (four on each segment) blackish, each emitting a single short whitish hair; subdorsal, a row of black warts, each with a single short white hair. Numerous minute whitish bristles all over the body. The spiracles are dark brown, with yellowish centres; anal segment tinged with yellowish and shining. Prolegs and anal claspers semitransparent, with a greenish tinge and tipped with brown. Food, tansy (*Tanacetum vulgare.*) An internal feeder; bores into the stem at the axil of upper leaves, and its presence may be detected by the frass exuded from the point of entry. May and June.

PUPA.—Whitish green, streaked dorsally and laterally with olivaceous brown; thorax humped; from the head is a beak-like projection, which is whitish in front and blackish at the sides; the lower portion of antennæ-cases are detached from the abdomen.

In confinement suspended by the tail from under side of leaf of food-plant. June.

Plate III., fig. 2, tansy (*Tanacetum vulgare*); 2 *a*, larva; 2 *b*, pupa; 2 *c*, imago of *P. dichrodactylus*.

I have to thank Mr. Saug, of Darlington, for kindly sending
rvæ *of* this species.

ACIPTILIA, Hub.

Galactodactylus, Hub.

(PLATE III., FIG. 3.)

IMAGO.—Expanse, 11–12 lines. Fore wing white, sprinkled with minute brownish scales towards apex; a small blackish spot on the costa beyond the middle, and a smaller spot a little below it, but nearer the tip. A small black spot at the digital juncture, another towards the tip of inner digit, and one between them on the inner margin; there is also a small blackish dot midway between digital juncture and base of wing. Fringes white, tinged with dark grey round the tips, and with a very conspicuous black patch in the fringes of inner digit. Tips of both digits acute, that of the inner deflexed. Hind wing white, sprinkled with brownish scales; fringes white tinged with grey. Tip of 3rd feather-shaft black. Head and thorax white. July.

LARVA.—Length, 5–6 lines; tapers towards anal extremity. Head smaller than 2nd segment, whitish green, with light brown mandibles and a black spot on each cheek. Ground colour pale pea-green; segmental divisions whitish. Dorsal stripe broad whitish, intersected by a median interrupted line of the ground colour. Tubercles, dorsal, two on each segment, placed on the outer edges of the dorsal stripe, each with a tuft of moderately long grey hairs; subdorsal, one on the posterior edge of each segment, with a few short hairs. Spiracular area, a wart on the middle of each segment, button-shaped, transparent and very prominent, with a tuft of long silky whitish hairs. Food, burdock (*Arctium Lappa*); eats holes in the leaves from the under side. May. When the leaves of burdock growing in or near woods are observed to have a riddled appearance, the younger leaves should be carefully turned up and the under sides examined for the larva of the "plume" under consideration.

PUPA.—Pale green; warts arranged as in the larva; hairs whitish, but not quite so long as in the larval stage; a short black bar or linear spot on the 2nd–6th segments inclusive, most conspicuous on the 5th. May and June.

I have given May as the month for the larvæ of this species, but they may be found from the middle of March if the weather is mild; but of course they will be then very immature.

Plate III., fig. 3, burdock (*Arctium Lappa*); 3 *a*, larva; 3 *b*, pupa; 3 *c*, imago of *A. galactodactylus.*

I am obliged to Mr. Walter W. Walter, Stoke-under-Ham, Somerset, and to Mr. Mann, of Clifton, for kindly supplying the larvæ of this plume moth for figuring and description.

MIMÆSEOPTILUS, Wallgn.
Pterodactylus, Linn.
Fuscus, Ritz.
Fuscodactylus, D.L.
(PLATE III., FIG. 4.)

IMAGO.—Expanse, 11 lines. Ground colour of fore wing cinnamon-brown, darker brown along the outer digit, and the costal margin dotted with black to the middle. The markings are inconspicuous, a short streak from the base nearly to the middle of wing formed of blackish dots, and a blackish twin-spot at the digital juncture; a minute black spot at the angle of outer digit, and two others near tip of inner digit, are the only distinct markings. Fringes rather greyer than the ground colour. Tip of outer digit acute and produced. Hind wing brown, with a purple tinge; fringes slightly paler. July.

LARVA.—Length 5 lines, slightly attenuated towards anal extremity. Head smaller than second segment, whitish, with a tinge of green and much spotted with blackish; mandibles brown, ground colour green; segmental divisions yellowish green. Dorsal line dark olive-green; subdorsal and spiracular lines whitish. Tubercles, two dorsal rows (four on each segment) with tufts of moderately long hairs, one hair of each tuft rather longer than the others, whitish; subdorsal, one on each segment, with a tuft of short hairs. Spiracular, one on each segment, with a few moderately long hairs. Prolegs and claspers semitransparent, with a green tinge; the former spotted with brown and the latter tipped with black. Food, germander speedwell (*Veronica Chamædrys.*) When young, feeds in the shoots, afterwards on the flowers, eating the petals. May and June.

PUPA.—Anterior portion whitish green, posterior portion whitish, suffused laterally with brownish. A narrow reddish dorsal line may be traced most distinctly in the region of thorax and hinder segments of body. Head truncate; eyes prominent, yellowish; thorax humped; body rounded; wing-cases have their lower third detached from the body. June and July.

Plate III., fig. 4, germander speedwell (*Veronica Chamædrys*); 4 *a*, larva; 4 *b*, pupa; 4 *c*, imago of *M. pterodactytus.*

I have generally found the larva of this species on the plants of speedwell growing on sunny banks, old walls, and such localities, and the perfect insect may be readily obtained by beating, or rather stirring, the herbage in these places.

It will be observed that descriptions of the larvæ of two species, viz., *M. pterodactylus* and *A. galactodactylus* have already appeared in these pages; but it has been thought desirable to re-describe them so as to follow a certain uniform style, that may facilitate identification in connection with the figures on the plates. I shall be always most happy to acknowledge assistance in matter or material for these papers from contributors to the 'Entomologist,' but venture to suggest that while these "Contributions to the History of British Pterophori" are appearing, independent descriptions of "Plume" larvæ, concurrently published in the same pages, may lead to confusion.

(To be continued.)

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. V.—THE SEA-COAST.

The beetles to be found on the sea-coast are so numerous, and in many respects so peculiar both in their nature and in their habitats, that it takes a long time to gain the experience necessary for working them to much advantage. A collector, however, who has hitherto collected only inland, will soon feel the sensation of delight that an Entomologist alone can feel, as he realises how totally different are the characters of the sea-coast and inland fauna. Each sea-coast district, too, has its peculiar species, and every fresh place near the sea which one visits is sure, if worked, to produce something new and rare, and very often in abundance; thus, some time ago, I got over a hundred specimens of the rare *Saprinus immundus*, at Hunstanton. Last year I found *Phytosus balticus* (not before recorded from Lincolnshire), in numbers at Mablethorpe; and last Easter I took *Ceuthorhynchidius Dawsoni* in profusion near Ventnor. The great secret of all working is, when you have found a good beetle, not to leave the spot in hopes of finding more further on, but to note carefully the circumstances under which you obtained the first, and work patiently until you have discovered their habits. A good deal of time may seem wasted, but when you have once found out the secret you will probably soon make up the time a hundredfold.

Although we have lately heard from Mr. McLachlan of a marine caddis-fly, and cannot of course, after this, tell what discoveries may be made, yet, so far as we know, no beetles are actual *inhabitants of the* sea. One or two rare beetles, however, as *Actecharis Readingi*, almost have a claim to the title, as they live on seaweed that is very nearly always immersed. A great number of Coleoptera are habitually found below high-water mark: some are covered by the tide, and we need not wonder at its not injuring them, when we remember what has been said about the beetles found in floods. Many draw back before the tide and return as it recedes: these beetles inhabit the shingle and the layers of rotting seaweed that are so often mixed up with it. Many good Staphylinidæ may be found in such localities, as for instance, *Lithocharis maritima*, *Philonthus fucicola*, *Homalota princeps*, *puncticeps* and *plumbea*, *Myllænæ*, *Tachyusa uvida* and *sulcata*, *Diglossa mersa*, *Bryaxis Waterhousei*, &c. The easiest way to work the shingle beetles is to examine the larger stones and rocks on a warm day, when the beetles may be found coming up from the shingle and running upon them, and may be taken in numbers. I have taken several of the above-mentioned beetles, and a good many *Ptenidium punctatum* with them, in this way, in the Isle of Wight. Heaps of seaweed just above high-water mark are very productive, if shaken over paper; farmers, too, often gather large heaps in the adjacent fields for manure,—these swarm with beetles in warm weather, chiefly Staphylinidæ, but *Bryaxis Helferi*, and good species of *Corticaria*, *Atomaria*, and other genera may often be found.

Collecting under stones on and near the beach is profitable. The curious *Lymnæum nigropiceum* is only found in shingle: still it prefers shingle under stones, as also do *Trechus lapidosus* and *Æpys*. Under the stones well above high-water mark and on the cliff sides many good species of *Harpalus* occur, and in many places in the south *Brachinus crepitans* is very abundant. Other Carabidæ, such as *Polystichus*, *Drypta*, &c., are found not far from the coast. Some beetles, like *Broscus*, which swarm on or near the shore in many places, are occasionally found far inland, so that in some few cases it is hard to say whether a beetle is exclusively a coast species or not. Many Hemiptera, too, are found under and at the sides of stones among herbage close to the shore, as *Podops*, *Ælia*, *Coreus*, and others.

Sandhills are extremely productive: the rushes and thick grass with which they are usually covered have generally, on a favourable day, a good many species upon them, but sweeping *does not* produce much, as the grass is so thick and stiff that the beetles are nearly all knocked off before the net reaches them. The best plan is to beat the rushes sharply, and then examine the sand underneath. By doing this I found one or two species I wanted in abundance, last year, at Mablethorpe. The larger species, as *Cteniopus*, *Sitones*, and others, and conspicuous Hemiptera, as *Therapha*, may be picked off with the hand. The brown species of *Cicindela* are sometimes abundant in such localities. On some large sandhills, as at Tenby, there are a lot of thyme banks in the hollows, and if the roots of these be loosened (especially where the plants overhang the numerous paths) a great number of species will come tumbling out, *Calathi*, *Harpali*, and many others. The best beetle I took in this way at Tenby was *Harpalus melancholicus*.

The sheltered hollows, just away from the sea, produce very good things, as the vegetation there is not nearly so rank, and much more diversified. The sweeping-net can here be used with advantage, and many good Curculionidæ, Coccinellidæ, Halticidæ, &c., may be found. By examining the damp sandy places often found among these hollows *Bledii* may be obtained in abundance (*B. opacus*, *B. spectabilis*, *B. tricornis*, and others), and sometimes very rare species as *Anthicus bimaculatus*. The *Bledii* are burrowers, and almost always live in companies, so where one is seen more should be looked for: they may often be found by the little casts they throw up on the sands.

Moss on sandhills is also worth examining for Staphylinidæ, *Agathidia*, and many of the small genera.

The sandhills of Deal and the adjacent coast are especially celebrated for good species, notably *Lixus bicolor*, and also for many species of Hemiptera, as *Odontoscelis*, *Eurygaster niger*, *Sciocoris*, *Pseudophlæus*, *Chorosoma*, and many others. Some very good Lepidoptera, too, occur at the same place.

The ground underneath plants on the shore and adjacent cliffs should be carefully examined: many of these plants are too large for the sweeping-net, and on being touched every beetle drops at once. On examining the soil at and about the roots, numbers may be found—chiefly Curculionidæ. Many beetles live actually at the roots, and may be found by pulling up the plants bodily and shaking the roots over paper. Thus *Otiorhynchus ligustici* lives at the roots of *Anthyllis vulneraria*, *Ceuthorhynchus verrucatus* at the roots of the yellow horned poppy, and many others have their peculiar plants, so that some knowledge of Botany, it may be easily seen, is absolutely necessary for a collector.

Very heavy rain is apt to spoil cliff-collecting by washing out many of the insects. This is very annoying if one only has a limited time by the seaside. If, however, the rubbish and long grass at the bottom of the cliffs be pulled about and examined, it will be found that many species will have gathered there. Sandy cliffs are very productive; clay cliffs not nearly so much so. The clay cliffs, however, have some good species peculiar to themselves, as *Nebria livida*, which I have obtained in abundance in the cracks of the clay cliffs at Bridlington, Yorkshire; its congener *Nebria complanata* is found hardly anywhere except on the flat burrows near Swansea. Usually there are sandy spaces in the middle of the clay cliffs, and these produce numbers of insects: in such a spot, near Bridlington, I once obtained, among a number of commoner species, *Harpalus tenebrosus*, *Dyschirius angustatus*, and *Bledius erraticus*, all entirely new to that part of the country. The names of these two latter beetles make me mention the fact that the two genera have some affinity, for they are usually found together; wherever therefore a good *Dyschirius* is found, a good *Bledius* should be looked for, and *vice versâ*.

In conclusion, I would say that the estuaries of tidal rivers, where the water is half salt and half fresh, are exceedingly profitable localities to work, and occasionally on a hot day in summer enormous quanties of *Carabidæ* (among them good species like *Pogonus luridipennis*, which is a true estuary beetle) may be found running actively on the mud reaches, or resting under the heaps of seaweed and refuse that always gather in such localities.

This paper might be extended to a much greater length, and there yet remains something to be said about sweeping in the neighbourhood of the coast; but sufficient hints have been given to enable a worker at the sea-coast to find something at all events, and, as he goes on collecting, he will be sure to gather fresh ideas from his own experience.

Many people at this time of year go to the seaside for a holiday, and when they get there are entirely at a loss how to occupy themselves. If such would only take up the study of some branch of natural history, they would find their enjoyment greatly increased, and would further find, in the objects they have collected, a pleasure *that would* endure long after their holiday had come to an end.

T [illegible]se, Lincoln, June 6, 1882.

FURTHER NOTES ON NORTH DEVON.

By Richard South.

I have just returned from a sojourn of some weeks among the "burrows," "combes," "tors," and "hoes" of North Devon, and think a few notes on my entomological experience whilst there might not be without interest.

The past mild winter, and more especially the early spring, had induced me to anticipate a good collecting season, on the ground of my last season's campaign, but I was disappointed. I expected certain species to be on the wing at least a week *earlier* than they were last year, but instead of this they were actually *later* by eight or nine days than last year's dates. The weather too, during the latter half of May and the first fortnight of June, was not altogether of that character best suited to the capture of Lepidoptera, for quite two-thirds of the days were either wet or windy, or both; and the nights as a rule were clear and cold, even frosty. Sugar was consequently almost an entire failure; on one night only (June 3rd) did moths come in any number to the sweets. The following day a big thunder storm upset the atmospherical equipoise, and the wind blew with considerable force from the south-west to north-west for several days afterwards. Indeed it was not until the 12th that the weather became again anything like settled, but it then only took a day's rest, for on the morning of the 13th commenced another squall, which continued until the 16th, when I metaphorically struck my tent and beat a retreat.

Argynnis Euphrosyne was not so abundant as its congener, *A. Selene*. This latter was to be met with in every copse near water, and by the side of most brooks whenever the sun shone; females were rarely met with.

Melitæa Athalia.—Larvæ of this species were found feeding on yellow cow-wheat (*Melampyrum pratense*) and foxglove (*Digitalis purpurea*); the former plant seemed the favourite food. On the 5th of June three imagines of the species were captured, and others afterwards to the 12th of June, on which date larvæ were still found.

Zygæna filipendulæ was very abundant in the larval stage at Braunton, on June 14th. At the corresponding date last year a few imagos were out, and there were plenty of cocoons, but not a larva was to be seen.

Nudaria mundana.—The larvæ of this species were of frequent occurrence on old moss and lichen-covered walls, and even on rocks by the sea.

The larvæ of *Boarmia repandata* were not nearly so numerous as last year, and many of them were only half grown on the 10th of June, at the same time I captured the imago. This incident well illustrates the eccentric character of the season and its influence on larvæ. Again, on the 12th of June I took three specimens of *Cidaria populata* (one of these very worn). I had observed larvæ of this species on the 7th of that month.

A few larvæ of *Toxocampa cracca* turned up in another locality, about two miles from where I found it last year. At its old locality, which was fully exposed to the gale we had in April last, the food plant *Vicia sylvatica*, evidently suffered, together with the surrounding herbage and tree foliage, having almost disappeared.

Plusia gamma was of frequent occurrence both by day and night, and reminded me of my experience of the insect in the Isle of Wight, in 1879; there desultory examples of the species were met with in May and June, in all sorts of places, and at all hours of the day. The following August the insects were in thousands. That season was in many respects, as regards its meteorological aspect at least, identical with the present. I have not my diary at hand, but I have a very lively recollection of the kind of weather which prevailed in the Isle of Wight, from May to August, 1879.

Last year I remarked the absence of *Tortrix viridana*, but judging from the quantity of larvæ of this species observed feeding on the oaks, the imago should not be scarce in North Devon this year. Some of the oak trees were nearly defoliated, and a flock of jackdaws were doing their best to check the ravages of the caterpillar upon the leaf-crop, by transferring them —the caterpillars—to their own crops.

Stigmonota redimitana was not scarce among oak, but difficult to get, owing to wind.

Ephippiphora turbidana did not appear till after June was well advanced, and then only in batches of three or four at a time, whereas last year it was to be taken a dozen or so on a day, at the end of May.

On the 20th of May, whilst working in a small oak copse, I struck at a small example of the *Tineina*, and in doing so my net brushed the low branch of an oak tree, from out of which came quite a cloud of *Micropteryx Thunbergella*. I of course made a sweep at these, and netted two dozen or more, all of which appeared perfectly fresh. Having boxed as many as I could from the first "catch," I jarred all the branches within reach and disturbed numbers of the insect. They seemed, however, only to occur amongst the foliage of the tree I had accidentally shaken. For several days after this wet and windy weather prevailed, and I did not visit this particular copse again until about the end of the month, when I met with *M. Thunbergella* occasionally, but only single specimens in indifferent condition were beaten out of various trees and undergrowth. Strange to say, the oak tree which yielded the insect in such abundance on the former occasion did not now appear to harbour a specimen. The possibility of oak being the food of this species seems strongly indicated, from the fact of its being in such numbers thereon when the specimens were in fine condition.

The other species of *Tineina*, as far as I have determined them at present, captured in North Devon, are as follows:—*Lampronia luzella*, *Micropteryx calthella*; of this last-mentioned species from three to eight examples at a time were boxed from flowers of the common buttercup (*Ranunculus bulbosus*), growing by the roadsides near water. *M. aruncella*, a few specimens by sweeping herbage. *M. Seppella*, resting in flowers of speedwell, (*Veronica Chamædrys*), on sunny banks, often several females on a flower; the male was rarely met with. *M. allionella*, from among bilberry; these were found settling on the leaves of nut, &c., in the early morning sunshine. *Nemotois Swammerdamella* and *N. Schwarziella* were both common, the former especially so.

Adela fibulella was frequently found resting in flowers of speedwell, and flying actively in the sunshine. *A. rufimitrella* was obtained by sweeping grass, &c., in the water meads, but only where *Cardamine pratensis* grew. One specimen of *A. Sulzella* at rest on a dock leaf, and *A. viridella* was abundant in oak copses. *Gelechia luculella*, flying high late in the afternoon. *Œcophora Lambdella* was bred from dead furze sticks. The best way to breed this species is to collect dead furze sticks, in any locality where the insect is known to occur; the wood should have the bark on, and the more decayed this is the better chance of *Œ. lamdella* being there. It is better not to examine the sticks for the pupæ, for, in nine cases out of ten, in stripping off the bark the pupa will, if present, be destroyed; at least, such was my experience, I grieve to say.

Glyphipteryx Thrasonella, common in a water mead. *G. equitella*, one example netted casually; plenty of stonecrop grew all over the district, so this species should have been common. I remember seeing a number of the insect in a garden in Camden Road, London, two or three years ago, among stonecrop.

Argyresthia nitidella and *A. conjugella*, the latter among mountain ash, but more often beaten out of heather in the vicinity of the shrub. With these I must conclude my list of the *Tineina* found in North Devon. As I have already stated, I took several other species, but have not yet identified them.

I append a list of spiders found in North Devon:—

ARANEIDEA.—*Harpactes Hombergii*, Scop., *Linyphia hortensis*, Sund., *Meta segmentata*, Clk., *M. merianæ*, Scop., *Tetraquabba extensa*, Linn., *Epeira cornuta*, Clk., *E. cucurbitina*, Clk., *Misumana vatia*, Clk., *Xysticus cristatus*, Clk., *X. lanio*, C. L. Koch, *X. luctuosus*, Bl., *Philodromus aureolus*, Clk., *Micrommata virescens*, Clk., *Ocyale mirabilis*, Clk., *Trochosa picta*, Hahn (alive), *Lycosa lugubris*, Walck., *Hasarnis falcatus*, Clk.

PHALANGIDEA.—*Urgabunus insignis*, Meade.

The collection was made by Mr. Edward Matthews and myself, and forwarded to the Rev. O. Pickard-Cambridge, who has been good enough to furnish the above list of the species.

With regard to *Micrommata virescens*, Clk., Mr. Pickard-Cambridge, says,—"These are fine examples, two males and three females. I find the females and immature males here and in many other places, but have never yet met with the male adult but once."

12, Abbey Gardens, St. John's Wood, N.W., June 24, 1882.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby.

Assistant in the Zoological Department, British Museum.

No. XVIII. NYMPHALIDÆ—NYMPHALINÆ.

(Continued from vol. xiv., p. 176.)

LIMENITIS AND ITS ALLIES.

The first genus of this group is *Lebadea*, which contains a few brown or tawny East Indian species, shaped much like *Limenitis*, but with the hind margin of the fore wings more decidedly concave. They are more or less distinctly banded or festooned with white, and the tips of the fore wings are always white, a character which will serve to distinguish them from any of the allied genera. They expand rather over two inches.

We now come to *Adelpha*, a large tropical American genus, one species of which extends as far north as California. The great majority of the species are of moderate size, brown, with a white band crossing the middle of the hind wings, and extending over part, at least, of the fore wings. On the costa of the fore wings is nearly always a fulvous band or blotch, sometimes opposite the end of the white band, and sometimes outside it, and often divided into spots by the veins. Sometimes there is a tawny band on the fore wings, and a white band or no band at all on the hind wings; and in one or two instances the fore wings are banded with red, and the hind wings are brown. The wings are shaped nearly as in *Limenitis*, but are generally somewhat dentated, and the fore wings are shorter; in some few cases the hind wings are tailed, and in others the butterflies closely resemble some of the South American species of *Apatura* in size, shape, and markings.

Turning now to the familiar genus *Limenitis*, we find it numerously represented in the northern hemisphere, but almost totally absent from South America and Africa, being represented in the former country by *Adelpha*, and in Africa by *Aterica*, *Cymothoe*, and other allied genera. Most of the known species of *Limenitis* are marked with a more or less continuous transverse band of white, and many of them equal or surpass our European *L. Populi* in size. The ground colour is nearly always brown; in a few instances, however, the greater part of the wings is fulvous, with few or no white markings, as in *L. Lycone* from Celebes, and in the remarkable North American *L. Archippus*, which closely resembles *Danaus Erippus* in colour, though it is a considerably smaller butterfly. This insect is said to extend its range to Venezuela, and is thus the only species of true *Limenitis* recorded from South America. *L. Artemis* is another well-known North American species: it is brown, with bluish suffused markings on the upper side, especially towards the hind margin of the hind wings, and with submarginal orange spots on the under surface, in addition to several other orange spots nearer the base. *L. Zayla* is one of the largest of the East Indian species: there is a white band on the hind wings only, the pale band on the fore wings being broadly fulvous. *L. Darasa*, another Indian species, rather larger than our *L. Sibylla*, has a narrow green band, which is broken into spots towards the tip of the fore wings.

The species of *Neptis* are very numerous in the East Indies. They are generally black or brown, with white or yellow markings, arranged nearly as in the European species. The species of *Athyma* and *Abrota*, which are also East Indian, are very similar, but are larger and more robust insects, with a broad interrupted white or tawny band on the fore wings, and one or two continuous ones on the hind wings; there is generally a long basal streak of the same colour on the fore wings. In many cases the males are marked with white, and the females with tawny.

Euphædra is a beautiful African genus, including species which measure about three inches across the wings, most of which are of a deep velvety black, suffused with bronzy green on the hind wings and on the adjacent portion of the fore wings, and generally with a white or yellow bar across the tips of the latter. One species, however (*E. Eleus*, Drury), is red, with a broad black white-barred tip to the fore wings, and black borders to the hind wings.

Euryphene is another African genus. Many of the species much resemble those of *Euphædra*, while in others the males are brown and tawny, and the females are tawny brown, with the tips of the fore wings broadly brown, and spotted or barred with white. In one curious species (*E. Arcadius*) the fore wings are green, with several rows of whitish spots, and their base and the hind wings are of a purplish brown.

Hamanumida Dædalus is a common African butterfly, measuring about two inches across the wings. It is brown, speckled all over with white, giving it, as has been frequently observed, some resemblance to a guinea-fowl. It is said to differ in tint, according to the colour of the soil on which it occurs.

Cymothoe is another African genus, including species expanding from two to four inches. The males are generally of a buff colour, deepening in some species into rich tawny or almost fulvous; the females are black, with more or less extended white markings. In *C. Sangaris* and *Uselda*, however, the males are of a deep blood-red colour; the female of the latter is black, suffused with orange towards the base, and with zigzag whitish markings towards the outside of the wings.

Aterica includes smaller species, likewise all African, generally expanding under two inches. The males are blue or fulvous, with rows of brown spots, more or less connected into bands: the females are brown, with buff markings. In *A. Cupavia*, however, the male is black, with three yellow spots across the tip of the fore wing, and a broad yellow band on the hind wings; in the female these markings are white.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Colias Edusa at Ely.—As very few specimens of this butterfly were recorded last autumn, your readers may be interested to learn that I captured one on June 25th this year, quite close to Ely. From the damaged state of its wings it appears to be a hybernated individual. It is a male, but in expanse of wings considerably beyond the average of that sex. I am sure that I shall not be alone in expressing a hope that it may only be the precursor of many autumnal representatives of this species.—Harold Harris; King's School, Ely, June 25, 1882.

Apatura Iris in Northampton.—I found on June 1st, at Yardley Chase, two larvæ of *Apatura Iris*, which turned to pupæ on June 15th and 16th.—F. J. Rasell; 30, Argyle Street, St. James' End, Northampton, June 22, 1882.

Hesperia paniscus at Barnwell Wold.—In reference to your remarks in the 'Entomologist' for June on the disappearance of *Hesperia paniscus* from Barnwell Wold, I may state that having visited the locality on Whit Monday we were unsuccessful in finding *H. paniscus* in the wood. In a field near, however, a pair were seen, one only being captured.—Thos. G. Fraser; 6, Kerr Street, Northampton, June 5, 1882.

On the Females of Lycæna Adonis and L. Corydon.—It seems to me that there is not any difficulty in distinguishing these insects one from the other, or in determining to which species a solitary specimen may belong. Undoubtedly the fringe is one of the tests, and an unfailing one too, and is aptly described by your correspondent; it seems also to be a trifle broader in *L. Corydon* than in *L. Adonis*. May I venture to remark in addition to this that, so far as my observation goes, *L. Adonis* always has a blackish ground colour, and invariably bright red spots (unless absent altogether); whereas the ground colour of *L. Corydon* is brown, sometimes approaching to slate- or lead-colour (highly glossy in fresh specimens), and the spots are of a dull red-brown, varying to pale ochreous. The scales, too, with which each is dusted or sprinkled (most in *L. Adonis*), are of the same tint as the respective males. On the under side, *L. Corydon* has by far the boldest spots, and a more striking appearance than *L. Adonis*, and is normally the larger insect of the two. I say nothing of times of emergence, as this would be of no service to those who are not in the habit of taking these species themselves. I shall be glad, if incorrect, to receive further enlightenment from your readers.—E. Sabine; 17, The Villas, Erith, June 12, 1882.

Danaine Butterflies not subject to the attack of Mites.—In the 'Proceedings of the Entomological Society for the year 1877,' p. xii., Mr. Meldola remarks that "he had observed that certain distasteful species of Lepidoptera preserved their disagreeable qualities after death, in proof of which he exhibited some butterflies found among an old collection of Indian insects, the greater part of which had been demolished by mites. The surviving specimens were all of protected species, viz., four of a *Euplœa*, one of *Danais plexippus*, and one of *Papilio pammon*. *Euplœa* and *Danais* were well known to be protected genera, since they serve for models of mimetic resemblances. With regard to *Papilio pammon*, Mr. Meldola stated that, in his belief, it was in some way distasteful, as he had seen it in swarms on the Island of Nancoury, Nicobar Islands, in April, 1875." In

Mr. Meldola's valuable translation of Dr. Aug. Weisman's 'Studies on the Theory of Descent,' p. 337, the translator, in a footnote, makes a similar statement. I lately became possessed of four cases of Indian Lepidoptera, which had been almost entirely destroyed by mites, but the Danaine butterflies were uninjured: there was one species of *Euplœa* and four of *Danais*, including *D. chrysippus*, *D. limniace*, and *D. plexippus;* the specimens of *Papilio pammon* were also in fair condition.—J. JENNER WEIR; Haddo Villas, Blackheath.

SMERINTHUS TILIÆ, *var.*—On June 8th a brother of mine captured a female *Smerinthus tiliæ*, of which, as it differs somewhat from the ordinary types of this insect, I append a description:—The usual dark green band across the centre of the fore wings is entirely absent, save for a large dark green pear-shaped spot in the centre of the wing, the apex pointing to the outer margin of the wing. The colour of the wings, from the thorax to about an eighth of an inch beyond the above-mentioned spot, is sienna-red, and beyond this of the usual normal colouring. —GEORGE T. ADAMSON; June 10, 1882.

MELANTHIA ALBICILLATA *var.* SUFFUSA.—I have to record that I have succeeded in obtaining, by breeding, a second example of *Melanthia albicillata* var. *suffusa*. On comparing it with the figure in the 'Entomologist' for May, 1881, I find the resemblance to be so perfect that it might have been drawn from the specimen now in my collection.—T. MELDRUM; Ripon, June 16, 1882.

PHIBALAPTERYX POLYGRAMMATA NEAR ROMSEY.—In the May number of the 'Entomologist' I stated that I had taken *Phibalapteryx polygrammata* in this neighbourhood. I have since learned, through the kindness of Mr. A. B. Farn, that my species is *P. lignata*, I having been misled by the transposition of the figures in Newman's 'British Moths.' I am very sorry that the mistake should have occurred.—E. BUCKELL; Ivybrook House, Romsey, May 30, 1882.

STAUROPUS FAGI IN DORSET.—I was fortunate enough to capture a fine specimen of *Stauropus fagi* on a tree trunk in a wood near here, on June 12th. I should be glad if any one could inform me whether there is a known British representative of the "Praying Mantis" of the tropics, as I have lately met with a minute insect which seems to be exactly like the foreign one in form.—*F. O.* PICKARD-CAMBRIDGE; Warmwell, Dorset.

Acronycta alni in the New Forest.—The other day I met Mr. Blanchard, of Parkston, who informed me that he had just succeeded in breeding ten fine perfect imagines of *A. alni*, from larvæ collected by himself in the New Forest last season. This is a most hopeful and encouraging sign to other frequenters of the New Forest.—W. M'Rae; Bournemouth, June 21, 1882.

Pachetra leucophæa at Box Hill.—On the 22nd ult., in company with the Messrs. Church, I visited Box Hill, and took a female of *Pachetra leucophæa* at rest on the trunk of a whitethorn. It deposited eggs, which have duly hatched, and are feeding well on *Poa annua*.—B. Arthur Bower; Eltham Road, Lee, S.E., June 18, 1882.

Catephia alchymista near Dover.—Calling on Mr. Davis yesterday morning to report on the curious moth I showed you in London, I found him busy setting his captures of the night before. They consisted of varieties of *Agrotis exclamationis*, with the exception of a gloriously perfect and fresh specimen of *Catephia alchymista*. The workable woods for sugar are, as a rule, singularly unproductive, and at some distance from the town of Dover, so it is gratifying to think that the perseverance and zeal of an enthusiastic artisan have at length been rewarded by taking such a rarity.—Sydney Webb; 3, Luther Terrace, Dover.

Psyche villosella.—I took two males of this species at Lyndhurst in June, 1880. I found them at rest on a fence.—L. F. Hill; 4, Craven Terrace, Ealing, W.

Notes on the Season.—This is, without exception, the worst season for insects I remember during all my entomological experience. Comparatively speaking there are none. *Fidonia piniaria*, which in our woods used to be in such extraordinary numbers, seems almost to have disappeared. Again at Edlington Wood, where two years ago, and again last season, *Asthena sylvata* was to be seen at rest literally by hundreds—so many as twenty on a single tree—it has appeared only in the most limited quantity. In one whole day's collecting I only saw four specimens. The same applies to *Abraxas ulmata*, *Melanippe hastata*, and *Epione advenaria*, in the same locality. Although I have given sugar a fair trial in several localities in Yorkshire, it has proved quite useless; frequently not a moth appearing. The absence of butterflies is also most remarkable. The mild winter has undoubtedly enabled the natural enemies of insects to clear away the greater part of the larvæ and pupæ, hence the rarity of Lepidoptera; but it is to be hoped that we shall have a good autumn season. To our local fauna we have to add *Scoparia basistrigalis*, one specimen being taken at Sandburn Wood. It has previously been taken near Selby and Doncaster, but not before so near York.—W. PREST; 13, Holgate Road, York, June 26, 1882.

ICHNEUMON OF CHELONIA PLANTAGINIS.—To-day, when taking a fairly good specimen of *Chelonia plantaginis* off the setting-board, I found an ichneumon larva (about half an inch long) spun up between the insect and the board, and saw a large hole in the abdomen of the insect, out of which it had evidently come.—C. E. NEWNHAM; Chippenham, June 8, 1882.

[May we suggest that our correspondent sends the ichneumon pupa to Mr. Fitch, Brick House, Maldon, Essex, who will doubtless let us hear more of its history.—ED.]

PANISCUS TESTACEUS, *Grav.*—A few notes on the life-history of *Paniscus testaceus* may not prove uninteresting to those who study our British parasitic insects. On June 14th of last year, in examining some larvæ of *Dicranura vinula*, I noticed a few little black shining objects hidden between the rolls of skin close behind the head. Suspecting that these objects were connected with some parasite I determined to leave them unmolested, having ascertained that they were firmly imbedded in the body of the animal, and that only half of each was observable, like an egg in an egg-cup. About a fortnight after this one of the black objects hatched, and the rest soon followed suit. The larvæ thus issued into the world were fat, footless, greenish white, semi-transparent creatures, attached head and tail to their host, swaying about with his every movement. Most of the *D. vinula* larvæ were so weakened by the attack that they died before reaching the pupal stage; but one survived, and built up a cocoon towards the end of August, the parasites being then—I write from memory—about a quarter of an inch long, and very fat and flabby. Towards Christmas I broke open the pupa-case, and found inside five long, spindle-shaped, dark brown cocoons, measuring from half to three-quarters of an inch in length, each sparingly enclosed in silk. In the midst of these was the skin of the hapless *D. vinula* larva, who had been sucked quite dry by his uninvited guests. The *perfect insects emerged* on May 19th, and proved to be

Paniscus testaceus. I have not seen any notice before of this external parasitism of *Paniscus*, and had previously considered that the ichneumons were internal parasites.—E. W. Andrews; University School, Hastings, May 30, 1882.

[Compare George Newport's life-history of *Paniscus virgatus*, Fourc., parasitic on *Hadena pisi* (Trans. Linn. Soc., vol. xxi., pp. 71—77, pl. viii., figs. 13—19; 1852). Also see Entom. xi., p. 251.—E. A. F.]

Odynerus pictus, *Curt.*—I am now able to complete the life-history commenced on July 18th, 1881 (Entom. xiv. 188). One of the larvæ, out of the four I brought home on July 13th, changed into the pupa state on May 4th, and was then of the same light cream-colour as the larva; on the 16th the eyes were black, and ocelli dark brown; by the 22nd the thorax became dark; by the 24th the thorax was black, and the abdomen very dark; on the 28th the abomen was black, the rings smoky white; 31st, clypeus and bands on the abdomen yellow; June 2nd, emerged from the pupa state within the cocoon, and apparently ready to commence the business of life; 4th to 6th, saw it engaged cleaning and brushing itself (within the cocoon); the imago emerged on June 7th, and proved to be a male. The second larva changed to pupa on May 8th, and is without doubt a female, the development of which has been very much retarded by the very cold weather: it is still in pupa, all the limbs are hanging free from the body; at a casual glance it appears like the perfect insect, with the exception of the wings, which are about one-third the proper length, are hanging down by the side, and brought slightly in front of the under side of the abdomen. The insect in the cocoon remains erect, resting on the anal segments of the abdomen, the thorax leaning against the cocoon. The other two larvæ produced *Chrysis ignita*.—G. C. Bignell; Stonehouse, Devon, June 21, 1882.

Chrysis ignita, *L.*—On June 19th I bred this insect from *Odynerus pictus*, from larvæ taken on July 13th, 1881, in the Plymouth cemetery.—Id.

Dipterous Larvæ in the Human Subject.—At one of the meetings of the International Medical Congress, Dr. W. G. Smith stated that a girl, aged twelve, presented herself with the following history:—About three months before being seen by a medical man an ovoid swelling appeared on the outer side of the ankle, causing her some pain and uneasiness in walking. This swelling gradually shifted its position and slowly moved up the leg, thence towards the right axilla, then down to the elbow, and finally settled on the back of the neck. In this position a small dark spot appeared, an orifice formed; and when pressure was made around this opening a white grub, nearly an inch in length, protruded, and escaped along with some unhealthy pus. Several other similar swellings developed upon subsequent occasions under medical observation, and the medical man extracted other grubs, exactly similar to the first specimen. No cause could be assigned for these curious phenomena. The larvæ were pronounced by competent authority to belong to a dipterous insect, although the genus could not be satisfactorily determined. There was no sufficient proof of the existence of an œstrus peculiar to man alone. A good abstract, from which the above is quoted, appeared in the 'British Medical Journal,' October 1st, 1881. I shall feel grateful to any of your readers who will give additional information or references.—WILLIAM E. A. AXON; Fern Bank, Higher Broughton, Manchester.

NOTE ON THE USE OF NAPHTHALINE IN CABINETS FOR THE PROTECTION OF INSECT COLLECTIONS.—In the 'American Naturalist' for May, 1882, p. 409, which Prof. C. V. Riley has most kindly forwarded to me, I find that "Mr. C. A. Blake, of Philadelphia, has been preparing cones of naphthaline run around a pin, so that they may be stuck into a box of insects, and that the naphthaline may permeate the box and last for a considerable time. They are made after a formula recommended by Drs. Le Conte and Horn, and are very convenient to handle. They gave such promise of usefulness that we obtained quite a lot of them, and went to the trouble of supplying all our insect boxes with the same. We have speedily rejected them, however, and give this note of warning, especially to lepidopterists, to whom they will prove particularly objectionable, as our experience of a few weeks suffices to show that they very quickly encourage greasing, and soon produce a relaxed, sordid, or greasy appearance of the insects. Another objection is that by deliquescence the pale chocolate colour of the cones communicates to, and discolours, the lining of the boxes wherever it comes in contact therewith." I am not aware that in England such a preparation of *naphthaline is ever* used; but the object of my note is to ascertain whether any entomologist, who has used the ordinary white crystalline form of naphthaline as a preservative against mites, has noticed that any ill effects have resulted. I may add that it has been used in my cabinets without any evil results, as far as I can judge.—J. Jenner Weir.

[We shall have some further remarks to make on this subject in an early number of the 'Entomologist.' So far as our experience goes, after long trial, naphthaline appears by far the best preventive against mites, and even mould, in collections, not only of Lepidoptera, but also any prepared Natural-History specimens, being highly fatal to life of any kind.—Ed.]

REVIEWS.

'*Matabele Land, and the Victoria Falls.*' Edited by C. G. Oates, M.A. London: C. Kegan Paul & Co. 1881. Coloured Plates and Maps.

The work under notice has been apparently published as a monument to one dead, by a surviving brother. The gist of the work consists of a series of letters and memoranda written in uncivilized Africa, by the late Mr. Frank Oates, F.R.G.S. These have been edited by Mr. C. G. Oates with great care and evidently as a labour of love. The work is profusely illustrated, not only with woodcuts, but by chromo-lithographic facsimiles of water-colour drawings taken by the traveller. These latter are very striking, being full of colour, one—that of the Victoria Falls—especially so. Added to these, in the Appendix are the plates (nine of which are coloured), devoted to the natural history portion of the work; four of these concern the readers of the 'Entomologist,' as they illustrate the more remarkable insects found in the collection made by Mr. Oates. There are also four elaborate maps for the reader's guidance and reference.

The editor devotes the first thirty pages to a memoir, which unfortunately but varies the too oft-told story of a young man who leaving home in robust health, on his voyage of scientific and geographical discovery succumbs to fever caused by the worry, fatigue, and privation of African travel. This memoir is rendered more sad by the clever cartoon, drawn by Mr. Charles Whymper, *of Frank Oates*' favourite pointer dog standing by the graveside *of hi*[illegible]r. This dog left the camp some eighty miles from the scene of its master's death, and was found by the boys sent in search of it, patiently watching by the grave. We are glad to find the faithful creature was rescued from starvation, and ultimately sent to England. There are also sketches by the same artist on other pages of the work.

The collections made by Mr. Oates were brought to this country, and having been examined were sent to the specialists in each group. The reports of these gentlemen form an important Appendix of some hundred pages. Among the more elaborate of these papers is an able review of the Ornithological work by Mr. R. Bowdler Sharp, F.L.S., and a report by Professor Westwood on the Entomology. This part of the collection, which was made in the south-eastern portion of Mr. Wallace's sub-region of "East Africa," has been added to the Entomological Museum of the University of Oxford. The Lepidoptera seem to have attracted his chief attention, other orders, however, being represented. Professor Westwood refers to seventy-five species of butterflies, several of which he describes and names. To those entomologists studying the geographical distribution of the Rhopalocera, reference should be made to this paper. This is a handsome book, suitable alike for the drawing-room or study.—J. T. C.

Exchange List of British Coleoptera.

THIS appears without imprint or compiler's name, but, from a private communication, we find it is claimed by Mr. A. E. Hodgson, of Coleford, Gloucester. This omission is unfortunate, for the work of compiling this list is so well done, that it would be rather a credit than otherwise to the compiler if his name were associated with the work. The list is founded upon the lines of the well-known exchange lists of British Lepidoptera, which have undoubtedly contributed more to the popularity of that order than probably anything which has been written upon the subject. We hope, now that coleopterists have the means of circulating handy lists of their desiderata, a great impetus may be given to the number of workers amongst beetles. Mr. Hodgson seems quite up to time, both in his list of recent additions to our Fauna and his arrangements, having separated the families Ptinidæ and Cissidæ from the Malacodermata, with the term Teredilia. The venture is worthy of the success which *we hope it will attain.—J. T. C.*

NOTES ON CURRENT ENTOMOLOGICAL LITERATURE.

Economic Entomology.—Miss Eleanor A. Ormerod, F.M.S., is not inclined to leave her "insect enemies" much peace. This energetic lady issues one report after another so rapidly, that before long she ought really to stir up her bucolic constituents to some sense of their duty, not only in trying to remedy the insect plagues of their neighbourhood, but also to furnish her with such observations as may help the Royal Agricultural Society's Consulting Entomologist to formulate the life-histories of these insects, and so be better able to suggest remedies for the prevention of their ravages. 'Report of Observations of Injurious Insects for 1881' has been issued, containing 107 pages, with many woodcuts. The turnip-fly, *Phyllotreta nemorum*, occupies a large portion of the report. This subject has also been treated separately, in a "Report" of 51 pages, with woodcuts. How important is the subject may be gathered from the statement that the financial loss varies in different districts from £2 to £5 per acre. The total loss may be roughly estimated when we state, that acreage of turnips and swedes under cultivation were returned on June 4th, 1881, as 1,149,768. These reports are well worthy of examination, and are so inexpensive as to be within the reach of all. Following up this work, Miss Ormerod recently gave another lecture before the Royal Agricultural College, Cirencester, 'On the Turnip Fly.' This is issued in pamphlet form. All these works may be obtained from W. Swan Sonnenschein & Co., London.

Artificial Destruction of Insects.—In 'Smithsonian Report, 1880,' just issued, are some remarks, where the following occurs (p. 253):—"It may be recalled that at the Portland (1873) meeting of the American Association for the Advancement of Science, Dr. Le Conte suggested that an efficient mode of checking the devastations of the insects injurious to agriculture might be the 'production of diseases' from parasitic fungous growths. He mentioned 'an instance in which from the communication of the disease by some silk-worms, the whole of the caterpillars in a nine-acre piece of woods were destroyed.'" Experiments have been made upon various forms, and lately on potato-beetles. Those inoculated with the fungous disease died in from eight to twelve days, while others in the same room, but which were not so treated, lived through the winter. Plant-lice were killed in a hot-house by similar means"

Fossil Entomology.—Mr. S. H. Scudder has compiled 'A Bibliography of Fossil Insects,' which appears as No. 13 of the 'Bibliographical Contributions,' issued in the 'Bulletin' of Harvard University. There are nearly one thousand references, with explanatory notes in most cases. To those who take interest in the insects which occurred in this world before man took to making excursions "with a green net and killing bottle," this compilation will be most useful.

Newspaper Entomology.—That "oldest evening paper," 'The Globe and Traveller,' devoted one of its daily essays (May 20) to "Insect Collectors." The writer has clearly views of his own upon entomologists, but whether they coincide with those of the latter is quite another matter. The entomologists might even go so far as to suggest the essayist should look up his subject a little more carefully before he writes "pot-boilers." In the same paper (May 26) upwards of a column is devoted to an article on insect dealers, founded upon that on 'British Lepidoptera' which recently appeared in these pages (Entom. p. 111). This latter writer seems to know more of the subject, and thereforemakes his subject more interesting.

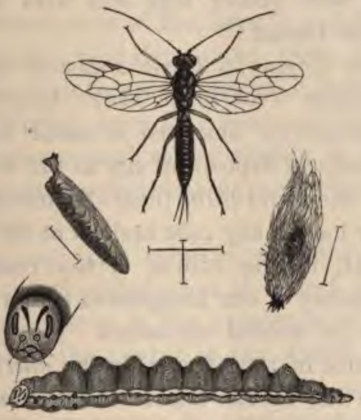
J. T. C.

THE ENTOMOLOGIST.

Vol. XV.] AUGUST, 1882. [No. 231.

EXTERNAL PARASITES OF SPIDERS.

By Edward A. Fitch, F.L.S.



Polysphincta tuberosa, *Grav.* (female).

More than one hundred years ago De Geer gave us the life-history of an Ichneumon preying externally on a spider. "Cet Ichneumon n'est guères remarquable que par l'endroit où il a vécu sous la forme de larve; mais il l'est beaucoup par cette circonstance" (Mem. pour servir à l'histoire des Insectes, ii., 863-6; pl. 30, figs. 1-3).

In June he found on an alder-leaf a small common spider, on whose body he saw a small white larva engaged in sucking it. After remarking how extraordinary it was that the mother Ichneumon should be able to deposit its eggs on the body of the agile and carnivorous victim spider, he proceeds to give the life-history of the parasite, *but says,* "J'ai beaucoup de regret d'avoir négligé *de prendre le dessein* de cette Araignée et de sa larva; je ne crus pas qu'elles auroient à me montrer tant de choses singulieres." He tells us that the spider spun a geometrical web in the box in which it was confined, but soon after he observed that the spider had fallen dead at the bottom of the box, and that the parasitic larva was spinning an elongate white cocoon in the centre of the web. Eight days later a very small Ichneumon emerged from the cocoon; it is described as of about the size of an *Apanteles*, and of no remarkable structure. His diagnosis runs:—*Ichneumon noir à antennes filiformes, à deux rayes jaunâtres sur le corcelet et à pattes jaunes.* Considering the size, this can hardly apply to a *Polysphincta;* but possibly a hyperparasite may have been bred, or possibly this note may lead to the identification of a small black Ichneumon with yellow legs and with two longitudinal yellow marks on the thorax.

Westwood next refers to these external parasites in his masterly 'Introduction' (vol. ii., p. 143). Quoting Dilwynn, he says, "I have frequently observed a small black species [of Ichneumon] successively deposit an egg in the abdomen of two or more spiders on the sand-hills [near Swansea]; and I doubt whether the spider had in any case arrived at its maturity."

John Blackwall, in the course of his researches into the functions and economy of our indigenous spiders, met with their external parasites on several occasions. He bred *Polysphincta carbonator*, Gr., twice in 1838 from *Epeira antriada*, one female on June 27th from the spider taken in April, and one male on August 16th from the spider taken on July 20th. He also tells us that an Ichneumon larva is frequently found attached to the base of the abdomen, or between the abdomen and cephalothorax of *Linyphia minuta* or *L. pusilla*, and that it feeds upon their juices, ultimately occasioning its death. The larvæ were stated to spin silken cocoons, and were most probably those of *Polysphincta* or *Acrodactyla* (Ann. Mag. Nat. Hist., xi., 1; 1843). Blackwall says that only one larva is found on a spider, "which indeed could not supply sufficient nourishment for two"; but Boie on June 14th found two immature specimens of *Epeira diademata*, one of which supported two larvæ of *Polysphincta carbonator*, and the other three; only one, however, on each spider reaching maturity. They spun their cocoons on June 21st, and the Ichneumons emerged on July 1st (Stett. Ent. Zeit., vii., 292).

In June 1856, Dr. A. Laboulbène found in the middle of a white spider's web, on a dry oak-leaf, three satiny white, dipterous-looking larvæ, and the dead spider (*Clubiona holosericea*, Linné). He suggests that the larvæ had fed on the eggs of the *Clubiona*, doubting whether there was sufficient of the Drassid to nourish the three larvæ. Laboulbène refers to the blackish cloud in the interior of the body of the larva, which "he did not believe" was an internal parasitic larva, but only the alimentary canal; and remarks that, after much hesitation, he was convinced that the feet (pseudopodes) were not upon the ventral, but upon the dorsal surface of the larva. One of these larvæ was killed in examination, but the other two spun oblong cocoons of thin white silk, and in about a fortnight two female Ichneumons emerged (Ann. Soc. Ent. France, 3rd ser., vol. vi., p. 798, pl. 17). Dr. Laboulbène's detailed description of the larva is as follows:—

"Larva elongate, slightly curved (figs. 1-3), composed of thirteen segments, counting the terminal tubercle (mamelon), but not the head. Whitish grey in colour, slightly shining, satiny. The dark alimentary canal shows plainly in its interior (fig. 2), and numerous whitish granulations are observable under the skin. Long 7 mm.

"The ventral region is concave, smooth, apod; the sides of the body are sharply rounded; but the most important point in the structure of this larva is the existence of 'pseudopodes' or false legs situated in the centre of the dorsal or convex region, and to which I shall again refer. Head small, a curvilineal triangle, brownish, appearing to be furnished with two small biarticulate antennæ (fig. 5 *a*), with a rounded, ciliated labrum, and with two mandibles. The parts of the mouth are not easy to distinguish. Thoracical segments largest of all, and rounded laterally and dorsally. Abdominal segments tuberculate? (mamelonnés?) on the sides, the 1st to 7th having in the middle of its back true retractile 'pseudopodes' similar to the false legs of caterpillars, having like them a crown of hooks, which holds them firmly in any position. The two terminal segments (8th and 9th) are trapezoid, forming, with the anal appendage, an inverted cone. There are nine pairs of spiracles; the first situated on the anterior margin of the metathorax; the second upon the 1st abdominal segment (4th of the body of the larva); the third, fourth, fifth, sixth, seventh, eighth, and ninth spiracles upon the *2nd to 8th abdominal* segments. A long central trachea traverses *the body, emitting* a branch to each spiracle; fig. 2 shows their arrangement. The tracheæ are white and silvery over the alimentary canal, but the last as well as those of its corresponding spiracles show black through the transparent body of the larva, under a lens. The surface of the body of the larva is very finely rugulose or covered with very fine wrinkles, which gives it a satiny appearance. I ought to mention the very numerous whitish granulations seen through the skin (fig. 2); similar granulations have been well described by M. Fabre in an interesting work on the Sphegidæ (Ann. Sci. Nat., Zool., 4th ser., vi., 167). He has observed the whitish granular appearance to be due to uric glands, really organs of secretion, in the larva of *Sphex flavipennis* and many others."

Laboulbène then refers to Barthélemy's mention of these granulate uric glands in the larva of *Scenometopia atropivora,* and to the references and figures of Réaumur, Roesel, Bouché, and Goureau, relating to the presence of the "pseudopodes dorsaux" in certain Ichneumonid and Chalcid larvæ. He also says that it is possible that this larva also has lateral tubercles, which he had overlooked in being so much occupied with the prominent dorsal ones, saying that "if they exist, they are not very marked."

A detailed description of the female Ichneumon is given under the name of *Pimpla Fairmairii.* It is said to be very closely allied to *Pimpla rufata,* Gmel., but it is well figured, without an areolet, and is undoubtedly a *Polysphincta;* whether it be a distinct new species is not now under consideration.

In the 'Proceedings' of the Entomological Society of London for January 4th, 1869, we are told that Prof. Westwood exhibited "an Ichneumon and an Epeira, the larva of the former being an external parasite on the body of the spider" (Trans. Ent. Soc. Lond., 1868, p. 1). But this is just so much information that only makes us 'long for more.'

In the spring of 1869 Snellen van Vollenhoven received from Herr Ritsema an immature specimen of *Miranda* (*Epeira*) *cucurbitina,* on which a parasitic larva was feeding. The spider spun a web on the following day, and the Ichneumonid larva continued to grow rapidly during the next three or four days, when it spun a cocoon, the skin of the dead spider dropping down. Twelve days after the completion of the cocoon a male *Polysphincta carbonator,* Grav., emerged (Tijd. v. Ent., 2nd ser., vol. v., pp. 17—19; 1870).

On July 25th, 1876, Herr C. G. A. Brischke's wife was enough to find, about three miles from Danzig, a

Theridion which carried a maggot on the back of its abdomen. This larva was then about three millimetres long, but by the next day it had doubled in size and was shining white, with red spots, the victim spider lying dead on the earth; the larva then gradually became whiter in colour, and on the 27th spun a thin, transparent, white, oblong cocoon, and later turned to a yellowish pupa therein. On August 9th—only fourteen days after the death of the spider—a male *Polysphincta boops*, Tschek,, emerged (Deutsche Ent. Zeit., xxi., 285).

In 'The Fauna of Devon: Ichneumonidæ" (Trans. Devons. Ass. Advanc. Science, &c., 1881) Mr. Edward Parfitt tells us that he had bred *Acrodactyla degener*, Haliday, from "a reddish larva, found feeding on a small spider. The body of the spider was not large enough to contain the larva, so that part of it was exposed. The spider lived until the larva was ready to undergo its change into pupa. It then spun a cocoon, fusiform and angular, attached at both ends to the glass cover of the box after the manner of a hammock. It remained in pupa about a fortnight, and came out September 19th, 1874" (*l. c.*, pp. 41, 42).

Ichneumon parasites of spiders' eggs are numerous, and many species have been bred from various spiders' nests, especially from the elegant little nests of *Agelena brunnea;* but it is not to these I now allude; it is to the interesting cases of external parasitism on the adult spiders. Notwithstanding all the above-mentioned published information, very little appears to be generally known on the subject; I am therefore glad to be in the position to bring forward two more instances from well known observers, and to be able to give a good figure of a *Polysphincta* larva from a drawing made by Mr. G. C. Bignell. The species of the genus *Polysphincta* and Haliday's closely allied *Acrodactyla* all appear to be rare in Britain. They are probably exclusively spider vampires, as Boie terms it, although Brischke gives *P. carbonator* as bred from a sawfly (*Nematus ventricosus*), but this is probably an error; both *P. rufipes* and *P. boops* he gives as bred from *Epeira diademata*. Ratzeburg gives many hosts, but the information and determination is somewhat doubtful.

The Rev. A. Matthews, of Gumley, thus writes:—"On July 4th, 1874, my brother, the Rev. H. Matthews, found a spider with a white maggot-shaped larva lying across its back, between the *thorax and abdomen*, firmly attached by each extremity of its *body to the under* side of the spider's thorax, between the articulations of the legs. He brought them immediately to me, and we placed them in a dry phial-bottle, with a few Aphides for food, and tied a piece of muslin over its mouth. The spider soon made a web in which the Aphides became entangled, and thus they remained for the rest of the day without any material change, except that at one time the larva had nearly emptied the body of the spider, and had himself become green; but this was only a temporary change, for shortly after he resumed his original opaque-white hue. On the following morning he had spun himself up in a long narrow orange cocoon, attached to the web of the spider, and had changed into a pupa; while all that remained of his unfortunate companion was a shrivelled skin lying at the bottom of the bottle. On July 14th the imago emerged from the cocoon in the shape of the Ichneumon which I now send, together with the aforesaid cocoon and the mortal remains of the spider. I am unacquainted with spiders, but suppose this species to have belonged to the *Epeiridæ;* its head and thorax were pale yellow, with pink shading, and its abdomen brilliant pea-green." The Ichneumon is nearest to *Polysphincta pallipes*, Holmgr., but does not exactly agree with Holmgren's description of that species; whether it is a variety of this or a new species must be left for further consideration. Its oat-shaped cocoon, which is ochreous in colour and quite opaque, is figured to the left in the woodcut. The spider is probably *Epeira cucurbitina*, Clerck.

Mr. G. C. Bignell, of Stonehouse, writes:—"*Polysphincta tuberosa*, Grav., bred from a greenish coloured spider beaten out of oak on the 22nd May, 1882: it is an external parasite, and the larva is too curious a looking little fellow to be allowed to pass unnoticed. When the spider was first beaten out, I asked the gentleman who saw it what it looked like; he replied, 'It is very much like a miller's man carrying a sack of flour'; to which I quite agreed, for it was laying sack-like across its back; it was full fed by the 24th. On the 23rd I had a good look at it, and made a sketch; it had no legs, but in place of them it had sucking-discs, two on the 2nd segment and four on the 3rd and 4th, six of them occupying the usual place of the legs; the other four were half covered with the skin-fold usually seen on lepidopterous larvæ; on its back it had eight tubercles, the first on the 4th, the others on the seven following segments; each e was surmounted with two rings of hooklets, with three or four in the centre. The object of these was to suspend itself by the web while feeding on the last remains of its victim, and holding on after it was consumed; when the whole of the spider's body had been extracted, the legs and empty skin were allowed to fall down. The larva then commenced to make itself a cocoon, which was finished by the third day; it was during this time the tubercles had to play such a prominent part, having to perform the work of the claspers of an ordinary caterpillar; when a tentacle attached to the silken cord had to be removed, it was done by withdrawing the hooklets into the tentacle, when it at once became disengaged and ready to make another 'attachment.' From one spiracular line to the other were rows of black dots, two on the 2nd segment and one on the remainder; the centre of each was occupied by a short hair. The anal segment often had a very important part to perform, by being brought round to the assistance of the mouth; I first observed this while it was feeding, to disengage some internal portion of the spider from its jaws; afterwards it was frequently used to attach the silk to some part of the cocoon when the blunt round head of the larva appeared not to be able to attach the silk to its satisfaction. When full fed the larva was about three-eighths of an inch in length. I have no hesitation in saying that this larva had fourteen segments (counting the head as one). Cocoon shuttle-shaped, whitish, and thin; the movements of the larva and pupa were perceptible through the thin cocoon. The perfect insect appeared on the 12th June."

Mr. Matthews' account of the larva changing colour before and after a meal is confirmatory of what Brischke says; and Mr. Bignell's express statement that the larva has fourteen segments is confirmatory of Laboulbène's description. Mr. J. B. Bridgman has seen and named both species, and, referring to *P. tuberosa*, writes, "I have the same species, given to me by Mr. F. Norgate, with the cocoon and spider-skin exactly like Mr. Bignell's."

The woodcut represents *Polysphincta tuberosa*, Grav., female, with its thin white cocoon on the right, to the extremity of which is attached a curious small black tassel of excrement. The larva (from Mr. Bignell's drawing) is represented below, with an enlarged figure of the head. The thick ochreous cocoon on the left is that of Mr. Matthews' species (Polysphincta pallipes, *Holmgr. ?*).

Maldon, Essex, July, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. VI.—EDGES OF PONDS—FENS AND MARSHES.

The edges of ponds often abound with Coleoptera; many of them belong to the same genera as those taken on the banks of rivers, but the species are usually different. Large reservoirs with gravelly banks often afford a favourite habitat for many *Bembidia*. Dr. Power twice took *B. obliquum* abundantly in such a locality. The shores of lakes also produce some good species, as for instance *Cryptohypnus maritimus*, which is found on the shores of Loch Rannoch; *B. bipunctatum* and *doris* are also found in like localities. We have now, however, to deal with ponds in the ordinary acceptation of the word, as we find them scattered everywhere throughout the country: the banks of the small ponds in open fields will produce very few species, and those of the commonest kinds, but a pond in a wood, or, better still, on the edge of a wood, only half surrounded by trees, and with a south or west aspect, will afford very numerous species, especially if the edges are rather swampy, and rushes grow round it. Many things may be found upon these, or running on the ground at their roots, but if they are mowed down and left to decay, the *débris* will be found to be very profitable. On the edge of such a pond near Repton, I found *Bembidium bruxellense* in abundance, and other *Bembidia*, three species of *Bradycellus*, *Trechus rubens*, a number of Staphylinidæ, and several very good Trichopterygidæ, including *T. cantiana* and *T. lætitia*. In a like locality near Lincoln I have lately obtained *Choleva spadicea*, *Anchomenus oblongus*, and other species. It is a very good plan to shake the rushes and rubbish over a sieve and collect the residue in a bag; this will be found well worth examining at home: from a small bag of such shakings sent me by post by Mr. W. G. Blatch, from a pond near Coleshill, I once obtained *Bryaxis impressa* in some numbers, *Evæsthetus ruficapillus* abundantly, *Ocyusa maura*, *Mycetoporus longicornis*, *Psammæchus*, and others.

Very good Staphylinidæ are to be found on the edges of ponds *and on* marshy ground, such as *Stenus major*, *S. proditor*, and *other Steni*, *Gymnusa brevicollis* and *variegata*, *Myllæna elongata*, *Tachyusæ*, *Deleaster*, and good species of *Philonthus* and *Homalota;* the very rare *Acrognathus mandibularis* is found near London amidst the rotten leaves on the very edge of stagnant ponds, half in and half out of the water.

On a warm day many good species will be found on plants growing out of the water; if these be struck sharply the insects will fall into the water, and may be picked out at leisure. The rare *Oxytelus fulvipes* has been taken in some numbers in this way in Needwood Forest, near Burton-on-Trent; *Galerucæ*, *Phytobii*, *Bagoi*, and others may also be obtained in the same way, although the latter and also *Phytobius leucogaster* are to be found in greater abundance by pulling up the plants bodily and shaking them over a sheet, as the beetles live submerged for a long time.

The stems of *Typha latifolia*, especially in winter, contain numerous species: in company with Mr. Blatch, who kindly shewed me the locality, I found *Baris T-album*, *Anchomenus puellus*, and others in Sutton Park, near Birmingham, and he has himself taken other much better species in the same place.

One of the most favourite localities with the London collectors is, or rather used to be, Hammersmith marshes: very rare beetles have been found there in some numbers. We must however pass on now to the consideration of the fen districts proper, which come in naturally in this connection.

Entomologists know well what a number of peculiar species of Lepidoptera the fens produce, and the Coleoptera are quite as peculiar, and will well repay any collector who may work them: the only Coleopterist who ever did very much work in the fens was Mr. Crotch, and I am indebted for many hints in this paper to Mr. Matthews, who once or twice accompanied Mr. Crotch in his expeditions.

We may divide the fen districts into three, the Lincolnshire fens, the Norfolk fens, and the Cambridgeshire fens: the former of these has been so much drained that it is the least profitable of the three, and it is the last that is the most productive, although a great number of good species occur in Norfolk in the neighbourhood of the well-known Broads.

In the fen districts it is customary to cut the sedge and reeds in large quantities, and carry it up the rivers in sedge boats, as they are called; if a collector will furnish himself with a sheet, and persuade the boatmen, which only requires a small fee, to shake the bundles over it as they unload them, he will reap a rich harvest,—*Odacantha melanura* in abundance, *Dromius longiceps* and *sigma*, and *Aetophorus imperialis* being some of the best species; these of course may all be found in their respective homes, but this is a very good way of obtaining them. The bundles must not be fresh cut, but must have lain some little time.

The smaller beetles that may be obtained in this way are legion. *Atomariæ* for instance, such as *A. gutta*, may be found by thousands; many *Atomariæ* seem to be fond of marshy places; thus *A. Barani* was found some time ago in a marshy place near Eltham, and I have swept *A. basalis* in numbers on low swampy ground near Repton.

Very good Trichopterygidæ occur in the fens, and very probably new ones would reward any collector who paid attention to them; at any rate exceedingly scarce species like *T. Kirbyi* and *T. Championis*, *Ptilium cæsium* and *affine* might be found in some numbers.

The Steni of the fens are very good. *S. palustris* may be obtained in large quantities by sweeping at Wicken Fen, and *S. opticus* at Horning Fen. *S. vafellus* and *S. fuscipes* also occur plentifully, and *S. argus* sparingly; *S. lustrator*, *S. proditor*, and others may also be found; other good Staphylinidæ, such as *Thinobius brevipennis*, *Lathrobium rufipenne* and *angustatum*, *Platystethus nodifrons*, *Micropeplus tesserula*, &c., may be obtained, and the pretty little *Hypocyptus discoidens* may be taken in thousands by shaking refuse and rushes as above described. *Euplectus ambiguus* may be captured by sweeping rushes on a hot day. *Chrysomela graminis* is extremely abundant at times, and occasionally *Phyllobrotica quadrimaculata*, and the very rare *Adimonia ælandica*, Boh. (*villæ*, W. C.) may be found in numbers. *Silis ruficollis* is a fen insect well worth looking out for with these. *Malachius ruficollis* sometimes occurs plentifully, and *Chrysomela gœttingensis* sparingly. *Hæmonia Curtisi* is also to be found.

Certain good Longicorns seem peculiar to the fens and fenny districts, as *Oberea oculata* and *Saperda carcharias*: the latter occurs near Lincoln. *Agapanthia lineatocollis* may be found not uncommonly on thistles.

Besides the *Dromii*, &c., above mentioned, the fens contain very many good *Carabidæ*, which may be found under refuse on the edges of ponds or in damp places; the Lincolnshire fens near Boston have produced *Badister peltatus* in quantities; the rare *Pterostichus aterrimus* and *P. anthracinus* are almost peculiar to the fens, and with *P. gracilis* and *P. minor* may be taken on Whittlesea Mere. *Blethisa multipunctata* and *Oodes helopiodes* are very seldom captured out of the fen districts; they have, however, been found at Askham Bog, near York. There are also other good insects which frequent the fens, but which are also found in other localities, and cannot therefore be called true fen insects, such as *Dyschirius æneus*, *Anchomenus oblongus*, *Elaphrus uliginosus*, *Amara consularis* (recorded by Mr. Dawson as abundant in Holme Fen, Huntingdonshire), *Panagæus crux-minor*, *Stenolophus Teutonus*, *Skrimshiranus*, *vespertinus*, and *dorsalis*, *Bradycellus placidus*, *Bembidium assimile*, and others. Several specimens of the very rare *Chlænius holosericeus* are said to have been taken near Whittlesea Mere in 1826, but I do not know whether the locality has since yielded a specimen.* We must not forget to mention *Trechus rivularis*, Gyll. (*incilis*, Daws.), which is so great a desideratum with all collectors. Mr. Dawson took two specimens at Whittlesea, and a labouring man found sixteen in the fens between Holme and Yaxley; it may therefore again turn up, but is very probably extinct in the latter locality, as almost the whole of the ground on which it was found was brought under cultivation about five-and-twenty years ago according to Mr. Dawson's notice of its capture.

We might suppose that the Curculionidæ would not be so well represented, but, as we might expect, several species of *Bagous*, *Grypidius equiseti* and others occur; there would probably be many species of *Phytobius* also; *Lixus paraplecticus*, which now appears to be becoming extinct, used to be found in some numbers.

I had intended to say a few words on salt-marshes and salterns, but I must defer them to the next paper.

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* It occurred in Burwell Fen and the neighbourhood in 1832, where Dr. Power took eight or ten specimens.—J. A. P.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. III.—CRYPTIDÆ.

The Cryptidæ include those *Ichneumones pentagoni* with a distinct lateral sulcus to the mesosternum, with few exceptions an exserted aculeus in the female, and with the spiracles of the first abdominal segment generally farther from its apex than from one another. Certain males might easily be mistaken for *Ichneumones pneustici*, but the females are at once distinguishable by their exserted ovipositor, except in *Stilpnus*.

Gravenhorst (Ich. Europ., vol. ii.; 1829) included the genera *Hoplismenus*, *Cryptus*, *Phygadeuon*, *Mesostenus*, *Baryceros*, *Hemiteles*, *Pezomachus*, *Phytodietus*, *Ischnoceros*, *Nematopodius*, *Mesochorus*, and *Plectiscus* in this family. *Hoplismenus* has already been included in the *Ichn. oxypygi; Baryceros* included a single South-American species; *Phytodietus*, and *Ischnoceros* are now included in the Pimplidæ, and *Mesochorus* and *Plectiscus* in the Ophionidæ. *Stilpnus* was included in the Ichneumonidæ by Gravenhorst; it unites the two families. Foerster, in his admirable 'Monographie der Gattung Pezomachus' (Berlin, 1851), makes seven new genera, besides *Pezomachus; Pterocormus*, a new genus made by Foerster for Gravenhorst's *Brachypterus*, is included, but this was founded on a single species (*B. means*, Gr.), since proved by Marshall to be the short-winged variety of *Ichneumon latrator*, which has already been referred to. Taschenberg ('Die Schlupfwespenfamilie Cryptides,' Zeits. Ges. Nat., vol. xxv., pp. 1—142; 1865) included the genus *Exolytus* amongst the Cryptidæ, but Holmgren has removed it to the Ophionidæ, and Brischke has taken the same view. Foerster made *Exolytus*, *Atractodes* and *Stilpnus* into a separate family, Stilpnoidæ: these three genera all have more or less complete pentagonal areolets and aculeus not or hardly exserted, thus having some resemblance both with the Ichneumonidæ and Cryptidæ; *Stilpnus* has an oval abdomen, whilst in *Exolytus* and *Atractodes* it is elongate, and in the latter genus is subcompressed. Taschenberg also included *Ischnoceros* and *Agriotypus*, and added *Linoceras*, *Brachycentrus* and *Orthopelma* as new genera. In Tschek's monograph of the Austrian Cryptidæ (Verh. z.-b. Gesell. Wien., vol. xx., pp. 109–

156, 403—430; xxii., pp. 231—252) many new species are described, but only one new genus, *Listrognathus*. Thomson (Opusc. Entom., fasc. v., pp. 455—527) divided the typical Cryptidæ into four tribes,—the *Cryptina*, *Phygadeuonina*, *Hemitelina*, and *Stilpnina*. The *Cryptina* are further subdivided into three sections, which include fourteen genera, eleven of which are new; the *Phygadeuonina* are divided into two sections and three subsections, which also include fourteen genera, all of which are new, except *Phygadeuon*. As these divisions and genera have not been generally adopted we shall not further refer to them.

In order to make the determination of species as simple as possible, we have adopted the broad generic divisions of Taschenberg and Foerster, with the necessary alterations and additions. The characters used in the table of species are those mainly referred to by Taschenberg, viz.:—the shape of the metathoracic spiracles, which are situated in the upper side of the metathorax, rather nearer to the scutellum than to the abdomen (see Entom. xiii., pl. i., figs. 2, 3 *a*, 3 *d*, 3 *e*); the completeness or incompleteness of the metathoracic areæ, which, when complete, consists of a superomedial area, and two lateral areas on each side (*l. c.*, fig. 2); sometimes the division between the middle and side areas is wanting, sometimes the upper or lower dividing line of the superomedial area, and sometimes the divisions between the lateral areæ. After these simple structural characters we have divided them into groups according to colour, but, as before, we must point out that colour is always variable and unsatisfactory.

Foerster's characters for the *Pezomachi* are as follows:—He first divides them into two large divisions, according to the presence or absence of a curved raised line dividing the upper part of the metathorax from the back or slanting part; this line is often more or less indistinct in the middle: he then subdivides them into those which have the hairs, and the pits in which they are placed, either dense or scattered; the length of the aculeus or ovipositor; the comparative lengths of the third, fourth and seventh joints of the antennæ. Generally speaking the scutellum is wanting in the genus *Pezomachus*, but in some species it is very indistinctly defined.

Ratzeburg ('Die Ichneumonen,' vol. iii., p. 157; 1852) formed the subgenus *Hemimachus* for those male *Hemiteles* which had the metathoracic areæ indistinctly defined; he included seven species, all bred from the cases of *Psychidæ*. Subsequent observations have proved that these species are only the winged males of certain apterous female *Pezomachi*, and we have no doubt but that further experience will show that most of the *Pezomachi* have winged partners; but this question will be more especially referred to under the respective genera. Wesmael first expressed the opinion that the winged males of the apterous female *Pezomachi* were to be found in *Phygadeuon* or *Hemiteles*. Foerster rather doubted this; but Ratzeburg's and subsequent observations on bred specimens go to prove its truth. The Cryptidæ are well illustrated by four plates in Vollenhoven's 'Pinacographia.'

The great value of bred specimens is well illustrated in this family; without their aid it is almost impossible to unite the two sexes of a species, and until both have been bred together we shall be unable to form a satisfactory table of genera. Taschenberg (*l. c.*) describes 96 species of *Phygadeuon*, only 18 of which are known in both sexes; 98 species of *Cryptus*, only 17 of which are known in both sexes; and 56 species of *Hemiteles*, only 14 of which are known in both sexes. Foerster described 189 female and 44 male *Pezomachi*, the sexes of one species only—the doubtfully British *Catalytus fulveolatus*—being described, and in this he follows Gravenhorst. Experience has shown that even this small number of mated species are not all legally married. Curtis says of *Hemiteles melanarius* and its female (*vicinus*), bred from *Pieris napi* pupa, "the female differs so materially that no one would suppose it was the legitimate partner of the foregoing male" ('Farm Insects,' p. 102). The sexes are just as dissimilar throughout the family, and we know that some species (*Phygadeuon fumator* and *Cryptus migrator*) have subapterous forms; also that the apterous female *Pezomachus rufulus*, has a fully-winged and subapterous male: these anomalies may be general. The genus *Hemiteles* is in a more unsatisfactory state than any other of this family. Foerster, in the 'Synopsis,' divides his family, *Hemiteloidæ*, into 72 genera, and this includes *Catalytus* and *Orthopelma*; whilst Gravenhorst, Ratzeburg and Taschenberg together describe just over 80 species.

Kirchner includes 642 species amongst the Cryptidæ in his unsynonymic 'Catalogus Hymenopterum Europæ'; Dours gives 57 species only as occurring in France; Marshall includes 257 species in his 1872 Catalogue, and several have been added since, as will be seen. Kirchner and Dours include *Agriotypus.*

Ratzeburg mentions the Cryptidæ as parasitic on five orders of insects,—the Coleoptera, Lepidoptera, Hymenoptera, Diptera, and Neuroptera,—and subsequent scattered observations confirm this diverse parasitism, as will be seen when the genera are treated in detail. We also know that several species of *Pezomachi* and *Hemiteles* have been bred from spider's eggs, and both these genera are commonly hyperparasitic on other Ichneumonidæ and Braconidæ; probably this is also their *rôle* when so especially attached to the case-bearing Lepidoptera (*Psychidæ, Coleophoræ,* &c.). The species are mostly gregarious in their parasitism, several being bred from one host, and the sexes are always very unequally developed,—all males or all females being bred, or never hardly more equally than within ten per cent. of one another; thus one male or female to ten females or males, as the case may be. Most of the species spin their gold-beater's-skin-like cocoons generally within the cocoon or case of their victim, when lepidopterous; they appear to be especially attached to the case-bearing or cocoon-making species. Westwood says, "In a species of *Cryptus,* of which I have observed the transformations, the cocoon is long, cylindric, and rounded at each end; and I distinctly noticed that it was composed of three separate layers, the two interior being very shining, and of a gummy membranous texture, and each of them formed of a distinct elongated cap at each end of the cocoon." Mr. Mink notices a jumping hymenopterous pupa, belonging to a species of *Cryptus* (Tijd. v. Ent. xv. 285).

Unlike the Ichneumonidæ, the Cryptidæ are not sun- or flower-loving insects, but they are generally found at the roots of low plants, or amongst dead leaves and *débris* in dry ditches, or at the roots of old trees, running or skipping about, with their antennæ rapidly vibrating; they seem very partial to clumps of tansy, and are frequently found on nettle, mint, or other leaves when covered with honey-dew; a few of the larger species, as *Cryptus tarsoleucus, C. assertorius, C. analis, C. peregrinator,* and *Phygadeuon jucundus,* &c., are, however, to be found on the blooms of *Pastinaca, Angelica,* and other Umbelliferæ. Many of the females, and all the *Pezomachi,* appear to hybernate, as they are *frequently* found, under moss and loose bark low down, from autumn to spring. Throughout the year more species of Cryptidæ may be captured with a coleopterist's sweeping-net, and a systematic examination of loose *dêbris*, than by any other means we know of; with the exception of a few common species of *Hemiteles* they are seldom seen on the wing. The very common female of *H. aerator* is frequently found running briskly upon the inside of our windows, while its bright-coloured male is seldom seen unless bred; any special habits, &c., will, however, be noted in fuller detail under the various genera. It is not of great consequence whether the Cryptidæ are pinned or carded, as most of the characters are taken from the upper side; the apterous *Pezomachi* are certainly to be carded for preference.

The following is the table of genera, following Marshall's catalogue, for the most part translated from Taschenberg and Foerster:—

A. Wings normally developed.
a. Aculeus hardly projecting.
Abdomen almost round and shining. - Gen. 1. *Stilpnus*, Grav.
b. Aculeus distinctly projecting.
* Areolet completely closed.
† Areolet pentagonal (almost quadrate or triangular).
‡ Apical joints of the antennæ of the female somewhat nodose.
§ Antennæ of the female filiform, the 3rd joint at the most twice as long as thick, or the entire antennæ between the middle and the apex thickened; if slender, then the metathorax with areæ. In the male the post-petiole is distinctly broader than the petiole and geniculated. - - - - Gen. 2. *Phygadeuon*, Grav.
§§ Antennæ of female elongate, filiform, never thickened in the middle, the 3rd joint generally three times, or more, longer than thick; if less, then the metathorax is without areæ. Post-petiole of the male not much wider than the petiole and slightly curved, consequently the 1st segment of the abdomen is slender. Gen. 3. *Cryptus*, Fabr.
‡‡ Apical joints of the antennæ of the female not thickened, cylindrical throughout.
× 1st abdominal segment, in both sexes, elongate; post-petiole hardly wider than the petiole, polished. Metathorax with two transverse lines, spiracles of metathorax linear. - Gen. 4. *Linoceras*, Tasch.
× × 1st abdominal segment of the female very short, almost sessile. Metathorax with only one transverse line which is angled, spiracles small and circular. Areolet very small. Gen. 5. *Cyrtocryptus*, Marsh. = *Brachycentrus*, Tasch.
†† Areolet quadrate or right-angled, proportionately very small.
o Metathorax rough, with two transverse lines and elongated spiracles. Insect not unusually slender. - - Gen. 6. *Mesostenus*, Grav.

oo Metathorax smooth, only the front transverse line present, with small circular spiracles. Insect very slender. Gen. 7. *Nematopodius*, Grav.
** Areolet of wings pentagonal in shape, but, in consequence of the absence of the outer nervure, not complete.
-+- Abdomen petiolated or subpetiolated.
+-+ Metathorax with areæ. - - - Gen. 8. *Hemiteles*, Grav.
+-++-+ Metathorax without areæ (males). . Gen. 17. *Hemimachus*, Ratz.
-+--+- Abdomen subsessile. - - - - - *Cecidonomus*, Bridgm.
*** Areolet of wings not present; if incompletely formed not pentagonal.
∽ Petiole of abdomen linear, aciculate, its spiracles placed before the middle. - - - - - - Gen. 9. *Orthopelma*, Tasch.
∽∽ Petiole widened at the apex, its spiracles placed behind the middle. Gen. 10. *Catalytus*, Foerst.
B. Wings abbreviated or entirely wanting.
a. Rudimentary wings present.
* Aculeus very short; either scarcely projecting or not half as long as the 1st abdominal segment. - - Gen. 11. *Cremnodes*, Foerst.
** Aculeus elongated; generally more than half the length of the 1st segment.
† Metathorax furnished with complete and regular areæ; 2nd and 3rd abdominal segments abnormally long. Gen. 12. *Stibeutes*, Foerst.
†† Metathorax generally without areæ, or these incomplete; 2nd and 3rd segments not abnormally long.
‡ Scutellum distinct.
§ Penultimate joint of the hind tarsi bilobed. Gen. 13. *Agrothereutes*, Foerst.
§§ Penultimate joint of the hind tarsi not bilobed.
× The rudimentary wings extending beyond the base of the metathorax; 1st abdominal segment punctured.
o Antennæ bi- or tri-coloured. - - Gen. 14. *Aptesis*, Foerst.
oo Antennæ unicolorous. - - - Gen. 15. *Oresbius*, Marsh.
× × Rudimentary wings not reaching the base of the metathorax; 1st abdominal segment more or less aciculate. Gen. 16. *Theroscopus*, Foerst.
b. Apterous.
‡‡ Scutellum not present, or at the most very indistinct. Gen. 18. *Pezomachus*, Grav.

NOTES ON THE SEASON.

By Richard South.

On every hand I hear complaints of the season from lepidopterists and others. The tale told by Mr. Prest, of York (Entom. xv. 162), is echoed by an entomologist working from the Kentish coast, and is quite in accord with my own experience in North Devon (Entom. xv. 153), and lately in Norfolk and Suffolk.

I hope we shall have notes from all parts of the country, and that at the end of the season these may be collated and commented on by one of our many scientific entomologists. In connection with this I would suggest the desirability of some organised system of records from various parts of Great Britain. If an entomologist in each of the chief centres would take upon himself the trouble of collecting the result of the observations of his *confrères* in the district, and embody such in a monthly report to the 'Entomologist,' he would, I submit, do much towards the advancement of the science. Beginners in the study often have interesting facts come under their observation, but, thinking such have been observed before, fail to take other than passing note of the occurrence. Again, are not the observations of experienced collectors, either from lack of time or inclination,—perhaps more often from a feeling of diffidence,—lost to the bulk of entomologists? I am not aware of any entomological society in England supporting an organ of its own, nor do I find that such societies contribute much to the literature of the science. There must be often papers read or observations made at the weekly, bi-monthly, or monthly meetings of one or other of the numerous entomological societies throughout the kingdom, which would doubtlessly be perused with interest by entomologists at large if such papers were published in an entomological journal. I do not advocate the sending in for publication simply lists of captures from well-known localities; but where an entomologist finds himself on new, or comparatively new, ground, some account of its insect fauna cannot fail to be of interest, more especially if a short note of habits, &c., is added to particular species.

As I have just alluded to my experience in Norfolk and Suffolk, perhaps it may be as well to give a synopsis of my entomological work in these counties from the end of June to the middle of July of the present year. Of the Diurni I only saw five species, vix., *Pieris brassicæ*, *Vanessa urticæ*, *Satyrus Janira*, *Cœnonympha Pamphilus*, and *Polyommatus Phlæas*; and of these only *C. Pamphilus* was observed in any number, but did not appear to be nearly so frequently met with as in ordinary seasons.

A few of the commoner species of Nocturni were met with, but all were decidedly scarce, with the exception of *Euchelia jacobeæ*; the larvæ of this species were in absolute profusion. I never remember seeing this larva so early in the year before, but have often met with it in August, and one year (1879) as late as September. This year, during the period mentioned, not only were the larvæ to be seen in all stages of growth from recently hatched to full fed, but imagines were flitting about in various grades of condition; some of them indeed were beautifully fresh.

Among the Geometræ a single example of *Lithostege griseata* was the only capture worthy of record; a few other common species occurred, but none in any quantity.

Although sugar was liberally used, and several natural attractions, such as honey-dew, rush-flowers, &c., were examined, only twelve species of Noctuæ were observed, in addition to a few specimens of *Hecatera serena* at rest by day on flowers of viper's bugloss (*Echium vulgare*), and four examples of *Acrophila sulphuralis* netted as they were flying in the sunshine; the last *A. sulphuralis* was a female, which I kept alive in the hope of obtaining eggs; on the third day after capture she deposited one egg, but died on the fifth day with further addition.

Two specimens of *Aventia flexula* were taken off a fence, and of the Pyralides only eight species were obtained, the best of which was *Spilodes cinctalis*. Representatives of the Crambites amounted to seventeen species, including *Platytes cerussellus*, of which species the small number of females captured was out of all proportion to the large number of males captured or observed. *Anerastia lotella* not scarce. *Homœosoma binævella* a few examples, and one specimen of *Phycis abietella*.

12, Abbey Gardens, St. John's Wood, N.W., July 26, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Vanessa Antiopa near Hampstead. — In August, 1881, a specimen of *Vanessa Antiopa* was caught at the village of North End, Hampstead; a village boy brought it to my house. As North End is only five miles from Charing Cross, I think it is worthy of notice.—J. W. Phillips; Percy House, North End, Hampstead, July 8, 1882.

Apatura Iris at Brentwood.—When at Brentwood, on the 1st inst., I observed two splendid specimens of *Apatura Iris* flying round the tops of some tall oaks. We watched them for more than ten minutes, but were unable to capture either.—W. J. V. Vandenbergh; *July 6, 1882.*

APATURA IRIS IN SUSSEX.—I captured with the net, on the morning of the 24th inst., outside a wood close to this place, a female specimen of *Apatura Iris*, and in the afternoon of the same day secured a male at the same spot; the former was in good condition, but the latter rather dilapidated. On a previous day I had missed a specimen in the same locality, owing to a strong wind blowing at the time.—H. T. HUTCHINSON; East Marden Rectory, Chichester, July, 1882.

SINGULAR HABIT OF APATURA IRIS. — It seems to be the invariable habit of *Apatura Iris*, upon first emerging from the chrysalis, to cling to the empty case with the head uppermost for five or six hours; and then reverse the position, and still clinging to the puparium, remain with head down and wings upward for a similar time. For the first attitude it is easy to account, as the wings could not well be developed in any other way; but why the insect should turn round and continue so long in the second posture I cannot understand. I should be glad to have the opinions of others, as well as observations in respect to other species upon their emergence holding, or not, to the pupa-case at all. Some *Argynnis Adippe* that I have been breeding, kindly sent by my friend Mr. Buckell, of Romsey, so far as I could see, passed from the chrysalis at once to to the top or side of the breeding-cage, to allow for the falling down and expansion of the wings, and this perhaps is the prevailing custom; the reversed position on the pupa-ruins being seemingly confined to "their Imperial Majesties" alone.—JOSEPH ANDERSON, JUN.; Chichester.

THE THREE BRITISH SPECIES OF PROCRIS TAKEN ON THE SAME HILL.—Cliff Hill, at the foot of which the town of Lewes is situated, is a chalk hill quite isolated from the rest of the South Downs, by the river and town on the west, by brook-lands in the south and east, and by the Weald of Sussex on the north; it is nearly circular, and has a diameter of between two and three miles. In the number of species of Lepidoptera, many rare, it is, so far as I know, unequalled by any other part of the South Downs with which I am acquainted. Last year *Agrotis cinerea* was taken in some numbers, and this year a few were captured; I was fortunate enough to take a fine female. The southern slopes of this hill are the head-quarters in England of *Trigonophora empyrea*; *Aporophyla australis* is often found on the hill, and each year new surprises greet the careful observer.

For instance, I, who have known the district well for nearly fifty years, never heard of *Papilio Machaon* or *Euchelia jacobeæ* being seen there by any one but myself, nor have I ever seen the latter species there until this June. The object of this note, however, is the genus *Procris*; and it was on Cliff Hill on June 15th, 1845, in company with my good friend Samuel Stevens, I first took these insects. My uncle, the late Mr. Auckland, had taken it the year before; and those two specimens I had exhibited at the Entomological Society, and set at rest the question as to its being an indigenous insect. How well I recollect the joy of James Francis Stephens at this addition to our entomological fauna; a note on this subject will be found in 'The Zoologist' of 1845, pp. 1084-5 On Cliff Hill, wherever *Poterium Sanguisorba* grows in abundance there *Procris globulariæ* may be found, in the second week in June, in perfect condition; this year, as the spring had been warm, it was somewhat earlier, but as cold weather supervened it continued to appear until nearly the end of the month. So far as my observation goes, *Helianthemum vulgare* grows on the hill only on the sunny slope of the northern side of the Coombe; here the plant, although in profusion, is stunted in growth, but extends over a few acres of ground; and about the third week in June the entomologist may be certain on a fine day to find *Procris geryon* in some numbers, and this is the only spot on which it can be found on the hill, so far as I am aware. I may here remark that, although *Helianthemum vulgare* grows on the Rest Hill in far greater luxuriance, I have not discovered *Procris geryon* there, although carefully sought for; nor am I aware that any other naturalist has been more successful. In the lower parts of the hill-valleys the soil, by disintegration, has become deeper, richer, and moister; here *Rumex acetosa* grows, and amongst these plants I found *Procris statices* in some numbers; it is by far the scarcest of the three species on the hill, and I have—as in the case of *P. geryon*—captured it but in one locality. It must, I think, be a mistake that, in the 'Entomologist,' vol. ii., p. 131, it is stated that the larvæ of *Procris statices* mines the leaves of *Oxalis acetosella;* it might feed upon *Rumex acetosella*, but not on the *Oxalis*, which grows in woods—localities in which *P. statices* is never found. On this Cliff Hill, for whose reputation I am most jealous, we find, as I have proved during the month of June this year, *the three* species of *Procris* living withing a mile and a half of each other, each confined to its own food-plant. *P. globulariæ* and *P. geryon* are mixed together, and *P. globulariæ* and *P. statices* also mingled; but from the totally different position in which *Helianthemum vulgare* grows to that occupied by *Rumex acetosa*, I have never found *P. geryon* intermixed with *P. statices*. The three species of *Procris* are gregarious, and the females have but little powers of flight, so that each flock on Cliff Hill has probably been isolated for thousands of years; especially is this the case with *P. geryon* and *P. statices*, and it would be very interesting to ascertain whether there is any local variation in flocks occurring in widely different localities and in different geological formations. I should welcome with gladness the opportunity of inspecting any of the species obtained from other counties; but I fear that the subject of local variation is not much cared for by entomologists generally, as my request of a similar character with regard to *Gnophos obscuraria* met with but one response, and of *Pieris napi* with none.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E.

CŒNONYMPHA DAVUS—OCELLI ON THE UNDER SIDE OF SECONDARIES.—Newman, when describing this insect in the 'British Butterflies,' p. 101, writes of the under side of the secondaries thus:—"The grey or marginal area has a median transverse darker cloud, in which the position of a series of ocellated spots is indistinctly indicated by mere dots." This description accurately describes the usual coloration of the species; but on the South Downs, near Lewes, the insect is frequently found with well-defined ocelli on the under side of the hind wings. During the month of June, this year, I have paid particular attention to this very common and generally neglected species, and could easily have captured dozens of the variety in question; I have some with as many as six well-defined ocelli, five having the black centre, with a white pupil. I found also that there is much variation in the size of the ocellus on the under side of the primaries; in some it was scarcely more than half, and in others double, the size of the figure in Newman's work. Occasionally, but rarely, the spot on the upper side of the primaries is wanting. —J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E.

RARE LEPIDOPTERA NEAR PORTSMOUTH.—On the 15th of September, 1879, a friend of mine, Mr. T. Larcom, of Shaftesbury Terrace, Gosport, took a specimen of Chærocampa celerio in his garden at dusk. He also bred in the same year a variety of *Euchelia Jacobeæ*, the wings being yellow and black, instead of the usual pink and black. Both specimens were sold last autumn. On the 1st of last August I took a specimen of the larva of *Acronycta alni* whilst feeding on hazel, on the edge of a copse on the northern side of Portsdown Hill, between Stakes and Bedhampton. It spun up on the 4th, making a cocoon of silk and small pieces of the leaves. The imago appeared on the 12th of May of the present year. Insects this season are very scarce in this locality.—W. T. PEARCE; 42, St. John's Street, Buckland, Portsmouth, July 7, 1882.

ACRONYCTA ALNI NEAR DONCATER.—I took a specimen of *Acronycta alni* on May 18th in good condition; it was sitting on the trunk of an oak tree in Sandal Beat Wood, near Doncaster. —L. H. PARKINSON; Avenue Road, Doncaster.

ACRONYCTA ALNI NEAR WAKEFIELD.—On June 7th I had the pleasure of capturing a very fine specimen of *Acronycta alni*, at rest on the bole of an oak at Haw Park Wood, near Wakefield. I believe that the imago of this species has not been taken in this district for some years.—J. WRIGHT; Hadfield Street, Wakefield, June 10, 1882.

STAUROPUS FAGI AT EPPING.—I have this year taken in Epping Forest three male and two female specimens of *Stauropus fagi*. The first of these, a fine male, I took on May 7th, and the last two males aud females on June 20th.—F. G. WHITTLE; 2, Cambridge Terrace, Lupus Street, S.W.

DIANTHŒCIA CONSPERSA.—I have this season taken a fine and long series of *D. conspersa* from the palings of the long fences, from Caterham Junction to Stoat's Nest in Surrey. It seems an odd habit for a *Dianthœcia* to be found at rest on a fence; even when the palings are made uncomfortably hot by the direct rays of sunshine. Other fence-loving species were remarkable by their absence, as appears most things in Lepidoptera so for this year.—JOHN T. CARRINGTON; Royal Aquarium, June 20, 1882.

EARLY APPEARANCE OF LITHOSIA PYGMÆOLA.—On July 1st I took a worn male specimen of *Lithosia pygmæola* on the hills here; but this year they are very scarce, as up to the present time (July 25th) I have only taken about twenty specimens.—R. HARBOUR; 1, Landport Cottages, Deal.

On the Scarcity of Lepidoptera in the month of June.—During the greater part of last month I was on the South Downs, collecting Lepidoptera; the weather was on almost every day wet, cold, and windy, and exceedingly few butterflies were on the wing; the only species which could be considered common was *Cœnonympha Pamphilus;* even *Lycæna Alexis* was rare, and *Lycæna Adonis*, usually a common species there, was very scarce; no doubt this was partially due to the cold, but I have long held the opinion, which the experience of this season confirms, that a mild winter is very unfavourable to Lepidoptera. In the evenings almost no Geometridæ or Noctuidæ were on the wing, and a few males of *Hepialus humuli* alone were seen on some evenings. I saw but one specimen of *Pieris*, viz., *P. rapæ.*—J. Jenner Weir; 6, Haddo Villas, Blackheath, S.E., July 4, 1882.

Total failure in Lepidoptera.—Can any of your readers explain the cause of the failure in imagos this year, and if it is generally so throughout the country? I have been many miles in search of, but find hardly any Lepidoptera of any description; not even a *Vanessa urticæ* or any *Pieridæ;* Geometræ and Tortrices are equally rare. Have also been out beating trees and shrubs for larvæ, but cannot find even any of these: there used to come hundreds of moths into the garden of an evening to the flowers, but now there is nothing of the kind to be seen. In fact, I have been out so often for nothing that I have quite given it up for the present.—S. Bradbury; Abbots Bromley, July 24, 1882.

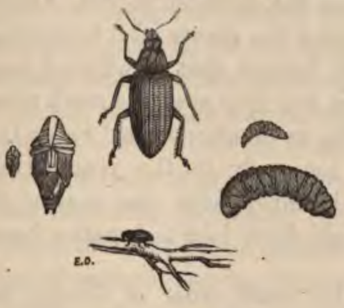
Spring Notes.—I have taken this spring rather more insects than usual. Two appeared very early, viz., *Arctia fuliginosa* on April 21st, and *Euchelia jacobeæ* on April 22nd. *Saturnia carpini*, however, did not leave the pupa till May 1st. *Tæniocampa munda* appeared on February 22nd. Sugar was not successful; I only took *Tæniocampa gothica.* At light I took *Selenia illunaria* and *Anaitis plagiata.* *Vanessa Polychloros* was more abundant than usual this spring. I have only visited the New Forest once this spring (May 15th), and that turned out a cold dull day. *Fidonia atomaria* and *piniaria* were taken on the heath. Amongst others I took *Lycæna Argiolus* and *Melanippe montanata.* *Nemeobius Lucina*, *Argynnis Euphrosyne*, and *Hepialus hectus* have been taken at Southampton this season.—H. E. U. Bull; Millbrook Lodge, near Southampton, June 4, 1882.

THE ENTOMOLOGIST.

VOL. XV.] SEPTEMBER, 1882. [No. 232.

A FEW NOTES ON THE LARVAL STATE OF THE PEA-WEEVIL, "*SITONES LINEATUS*," LINN.

BY THOMAS H. HART



SITONES LINEATUS.

FROM the time I began the study of Entomology the mystery attaching to the early stages of the pea-weevil has always been a source of attraction to me. Nor have there been wanting circumstances to keep it fresh in my mind. At one time my beans, at another my peas, have been attacked by it to my cost, and I have also attributed to a *Sitones* much of the damage done to my clover in some seasons; but all my efforts to discover the egg or larva were futile. Plants by the dozen were drawn from the infested crops and critically examined, as were innumerable growing plants, but neither leaf, stem, nor root disclosed anything. The old story was repeated last spring. *Sitones* threatened the complete destruction of six acres of grey peas. All the means at our disposal were unavailing to check its ravages, and but for a timely shower to reinvigorate the plants the crop must have been lost. Here, again, all my endeavours to detect the egg or larva were to no purpose, until one morning a letter arrived containing a reference to a clover root-feeding larva. This set me pondering once more, and in the evening I wandered aimlessly into the pea-field, my brain busy with *Sitones*. I went to work, and the result was that before I left I had discovered a small white grub feeding at the root of the peas, which on examination proved to be curculionideous. Elate with my success, I sought and procured more of the grubs, despatched specimens to the care of others interested in the subject, and placed a few in security for my own observation. This was on the 31st of May, and on the 4th of July I had the gratification of seeing the first perfect *Sitones lineatus* in the box where I had placed the pupæ. Thus, by digging up the plants bodily and carefully removing the earth from the roots, was the problem solved, whereas in all previous attempts I had drawn the plants after loosening the soil, and consequently had left behind that of which I was in search. Evidently John Curtis was very near the mark when he examined the bean roots for galls, as mentioned in 'Farm Insects,' p. 345; but probably it was too early in the year. Had he repeated his search at intervals throughout the season there is now little doubt that he would have laid the matter bare some forty years ago.

Contrary to the usual order of things, the pea-weevil does comparatively little mischief in the larval state. True there were indications of the grubs having eaten channels along the main root, but the peculiar gall-like growths on the fibres appear to be their favourite food. It is just possible that they may have to do with certain portions of a crop dying away prematurely in dry seasons by destroying the fibres or causing excrescences to grow on them, and thus diverting the flow of sap from its proper course; but with sufficient moisture, fair tilth, and cultivation there is reason to believe that the plant will arrive at maturity notwithstanding the grubs. The fact that several of the larvæ had ensconced themselves within the above-mentioned galls made me suspect their formation was due to the insect, but I could find nothing in those without a visible entrance to confirm my suspicion.

In its perfect state, however, the weevil more than compensates for the apparent harmlessness of the larva; its depredations are little noticed till the following spring, but no sooner do the peas and beans show above ground than we are painfully reminded of their presence. A succession of wet days, or prevalence of east wind, or other cause to check the plant, and the havoc committed in a short space of time is heartrending to witness. The leaves are scalloped round the edge into fantastic forms, the younger ones often being eaten to the midrib; the stems turn yellow; what remains of the leaves assumes a purplish tint, and, if the weather still continues unfavourable, the crop is lost. Yet the cause of all this mischief is invisible to the ordinary observer. The habit of the insect is to fold its legs and fall at the least alarm, and remain hidden among the clods during the day, coming out to feed at night. Should the soil in which it is secreted be disturbed it will roll about amongst the clods without giving any sign whatever of life; but press the ground for some half-yard square firmly with the foot, go down on one knee, remain motionless, and in a few seconds the place will appear alive from the innumerable weevils that will push their way through to the surface. This gives us a clue to the remedy. If the weather admits of the free and repeated use of the roller, a great proportion of the beetles will be crushed or smothered by preventing them coming to the surface for air, and the plants—freed in a measure from their constant gnawing, and, being assisted shortly afterwards by the hoe—will make new and vigorous growth, and soon bid defiance to what are left of the insatiable little beings.

It would appear that the eggs are deposited beneath the surface of the ground at the time the beetles are devouring the plants, but in what manner still remains to be cleared up.

Appended is a short description of the different stages of the weevil in question:—

The maggot-like larva is white, plump, and wrinkled, with brown horny head, and a pair of powerful projecting jaws. Each segment bears a few short hairs. Legs none; anal segment used as a foot. When full-fed it forms an oval cell without lining, about two inches underground, and at once undergoes transformation.

The pupa is also white, but as it matures the eyes becomes black and the rostrum pitchy; rostrum bent down on to breast; legs folded under thorax; wings and elytra brought round so as to cover posterior pair of legs, not sealed down; each segment with a *row of spurs and* anal one with a pair of long spines at apex.

The imago is at first creamy white, with head pitchy and eyes black, soon, however, becoming entirely black (with exception of part of legs and antennæ, which are red), and clothed with silver-grey scales, three stripes along the thorax being of lighter shade than the rest. Specimens confined in a box attained their normal colour in about forty-eight hours, but at large the beetles do not appear to leave their nidus for some time longer, probably to admit of their integuments becoming fully hardened before exposure.

Park Farm, Kingsnorth, Ashford, Kent, July 21, 1882.

Note.—With regard to the deposit of eggs, I am able to state that, somewhat earlier in the season than the date at which the larvæ of *S. lineatus* were observed by Mr. Hart amongst the pea-roots, I have found that weevils taken from off the peas paired and laid eggs profusely in captivity. These small white eggs were laid indiscriminately on the glass and cork of the cage, or on any surface, there being no depth of earth wherein to bury themselves for oviposition, and all the eggs perished; but looking at the circumstance of the egg-laying just preceding the time of the larvæ being found, and connecting this with the known habit of the pea-weevil of burying itself in the earth, there seems to me, though we have no direct record as yet on the subject, to be little doubt that in April or May the females go down to oviposit a little below the surface of the ground amongst the pea-roots.—E. A. Ormerod.

CAPTURES AT FOLKESTONE DURING JULY.

By Reginald E. Salwey.

A three weeks' stay at Folkestone during July having proved not wholly unsuccessful from an entomological point of view, may perhaps be worthy of record.

The universal outcry upon the dearth of spring and early summer Lepidoptera quite coincided with my own experience, and I did not arrive at the seaside in a particularly hopeful frame of mind. During the greater part of our stay I was accompanied by Mr. W. Harper, who as usual proved an able assistant; we had to contend against heavy rains and an unusually cold S.W.

wind, which is very disastrous to collecting on the Kentish coast; but, considering the season, we did fairly well.

The usual Diurni were decidedly scarce. We only took one hybernated specimen of *Colias Edusa*, a few *Lycæna Alsus* and *L. Alexis* on the hills, *L. Corydon* at St. Margaret's Bay, and *Hesperia linea* in the Warren. I did not even see *Argynnis Aglaia*, and *Satyrus Hyperanthus* was rarer than is usual; but this species was carefully looked over, and yielded five specimens with spotless under sides. *Arge Galathea* were few and far between, though they abounded at Dover.

The Geometræ were most to the fore. I netted *Acidalia strigilata* in the Warren the day after our arrival, June 30th; this was considered by local collectors a very early date, and there are now in my store-box about two dozen of this *Acidalia*, beaten from clematis, or netted at dusk between the above date and July 22nd. The Warren also afforded us the following Geometræ:—Single specimens only of *Gnophos obscurata* and *Eupithecia subumbrata; E. absynthiata* from ragwort at dusk, a few *Angerona prunaria, Acidalia scutulata, A. ornata*, and *Cidaria fulvata*. The clematis supplied plenty of *Melanippe procellata* and *Phibalapteryx tersata;* now and then *M. galiata* turned up, and later on *A. gilvaria*. The hedges at the base of Cæsar's Camp and the Sugar Loaf Hills enabled us to add some fine banded *Camptogramma bilineata* to our score; also *Eupithecia isogrammata, Asthena luteata, Ligdia adustata*, and *Cidaria pyraliata*.

Several expeditions to Raindean Wood were fairly profitable. We easily obtained a number of prettily varied *Cidaria russata*, and *C. immanata*. *Acidalia sylvata* was moderately common, but worn; *Larentia didymata* a pest; *Emmelesia affinitata* and *Scotosia undulata* scarce; single specimens of *Geometra papilionaria, Macaria notata, Melanippe albicillata*, and *Cidaria picata* occurred.

Two trips to St. Margaret's Bay sufficed to provide me with a fine lot of *Callimorpha dominula*, but no noteworthy varieties. The Diurni were much more abundant there than at Folkestone. After working hard in the Warren every available day for *Sesia chrysidiformis*, our score proved lamentably small. This species is comparatively scarce now; six or seven years ago I used to take it plentifully on one small spot, but the constant removal of the food-plant for breeding purposes has indisputably done much to render this beautiful little clearwing rarer at Folkestone.

Setina irrorella also has declined in numbers there of late years. We of course found *Euthemonia russula* on the hills, the female large and strongly marked; the *Calligenia miniata* at Raindean Wood were proportionately large, and many Lepidoptera are above the normal size on that part of the coast. Three "footmen," *Lithosia complana*, *L. complanula*, and *L. griseola*, turned up in the Warren.

A large patch of viper's bugloss (*Echium vulgare*) in full flower at the top of the Horse Shoe Hill afforded us sport at dusk, though several evenings the climb was quite labour lost, the wind proving too violent for any but such plebeian and hardy insects as *Agrotis segetum*, *A. exclamationis*, and *Triphæna pronuba;* but on favourable nights we were able to pick out from a host of the three above-named species a few more aristocratic moths: *Chœrocampa porcellus* to start with, and then the Noctuæ: *Heliothis marginatus* next (this *Heliothis* especially favours bramble-blossoms); and later, *Leucania lithargyria*, *L. pallens*, *Neuria saponaria*, *Mamestra anceps*, *Xylophasia sublustris*, *Agrotis corticea*, *Hecatera serena*, and *Cucullia umbratica;* but *Heliothis marginatus* alone came at all freely. When the bugloss faded and failed we tried ragwort, and thistles in secluded corners of the Warren; *Caradrna alsines* was common at the ragwort; *C. cubicularis* and *Leucania conigera* turned up, also the more acceptable *Mamestra furva*. Throughout the month *Bryophila perla* was well represented at rest on the Martello towers, whence we boxed about forty. *Euclidia glyphica* occurred abundantly on the hills, and was in fine condition.

Sugaring did not do much towards swelling the number of our captures; *X. sublustris*, *Minia literosa*, and *M. strigilis* were the most frequent attendants, but the local *Xylophasia* did not abound this year. A very few *Rutina tenebrosa*, *Noctua triangulum*, *N. baja*, and *Hadena dentina* were occasionally attracted. Two nights' sugaring at Raindean Wood only produced one *Cymatophora or*, four *Acronycta tridens*, and a similar number of *A. ligustri*. Among the Deltoides and Pyralides which I brought away, *Rivula sericealis*, *Botys lancealis*, and a fine series of *Ebulea verbascalis* are the most noteworthy.

The number of species generally was not poor, but of specimens remarkably so, especially among the Noctuæ. The decadence of *S. chrysidiformis*, S. irrorella, and G. *obscurata* in this favourite locality of late years is to be deplored. I believe a fair number of *Dianthœcia albimacula* were taken on this part of the coast during June, and the luxuriant and varied mass of wild flowers in the Warren, which is spreading rapidly over the scene of the well-known landslip, should, if undisturbed, prove an attractive bait in future years to many good species.

Summerfield, Weybridge, August 15, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. VII.—SALTERNS AND SALT-MARSHES—WATER COLLECTING.

Salt-marshes contain many peculiar plants, and to these certain beetles, especially Curculionidæ, attach themselves: thus *Apion limonii* may be found in abundance on the sea lavender (*Statice limonium*). Many good Carabidæ may also be found under stones or running on the mud, but they do not differ as a rule from those already referred to as frequenting damp parts of the sea-coast.

One of the best collecting grounds in the country is Lymington Salterns: the Salterns consist of a series of ponds, some empty, and some half full of brackish water, with the dry parts and the intervening spaces covered with maritime plants; at the roots of these plants or running upon the sand many species may be found. My wife found the rare *Anthicus salinus* in abundance in April, and also *Gronops lunatus*, and later in the year I found *Sibynes arenariæ* in the greatest profusion, and several other insects I wanted. I only had part of a day to collect in, or I have no doubt that I should have found many good beetles (such as *Aëpas*, *Dyschirii*, *Bledii*, &c.). I should strongly recommend any Coleopterist who visits the New Forest to run down and work the Salterns for a day at least, as they are a very short distance from Lyndhurst and Brockenhurst; they used to be a very favourite locality with many of the old collectors, such as Mr. Dawson and others, if we may judge from the frequent allusions made to them in their writings.

With this passing mention of salt-marshes, which properly belonged to the last paper, we must go on to the main subject of our present one, namely, water collecting. The water beetles are a study in themselves, and require special working and special apparatus.

The net used should be made of cheese cloth, and it is best, as was said in the introductory paper, to have its edges furnished with rings instead of with a turned-down edge of stronger material, as is often the case; nets thus made are easily run on and off the large ring of the net, and so a water-net may very readily be substituted for an ordinary sweeping-net, or *vice versâ*.

The usual round net is quite sufficient for ordinary water working, but if there is much moss or growth surrounding the water, as is the case with ponds on boggy land, by far the best form of net to use is an oblong or semicircular one, made with a straight metal edge or edges (like a prawning-net in fact), for scraping the sides, as great numbers of the best beetles, especially *Philhydrida*, are thus obtained, which would be entirely missed by the ordinary net. Archdeacon Hey, of York, has designed several of these nets for working Askham Bog, which he has done with very great success, and taken many hitherto very rare beetles in numbers.

A few words as to setting water beetles, more especially *Hydropori*, may be useful. The best plan is to keep them alive in damp moss, kill them with boiling water, and brush them out and set them at once: they are killed so instantaneously that brushing out the limbs may almost be dispensed with. If, however, this plan cannot be adopted, they may be put in the usual way into the laurel bottle, but should never be left more than one day. As they are of course always damp when caught, if they cannot then be set it is best to put them in muslin bags and dot them on card at one's leisure, without attempting to set them, as there is nothing more trying to one's patience than the attempt to set a refractory *Hydroporus*. The hind legs, especially of the *Agabi* and like genera, are always a difficulty; they may either be drawn down and set parallel to one another, or curled over the back; the former is much the neater plan, and may usually be managed by gumming the front part of the insect strongly to the card and letting it dry, when the hind legs may in most cases be easily drawn down to the required position.

The water beetles, as a rule, are not very brightly coloured, but we find that the brighter species inhabit running streams, while the duller ones are found in stagnant water, the former are usually the best species, but this may be due to the fact that the latter are more easily found, and therefore commoner.

Almost every stagnant pool in summer contains some beetles, and very often a tiny puddle will yield a more abundant harvest than a large pond: the water beetles are amphibious, or more than amphibious, for they can swim in water and walk on land, while their ample wings enable them to fly powerfully through the air; in consequence of their facility of movement from place to place, we find quite recent pools and puddles sometimes alive with beetles; drought does not affect them, for if a pool dries up they do not perish like the fish and other inhabitants, but have only to seek a fresh habitation; they are not very discriminating, and are evidently guided to water by sight, for they are often found on hot-bed frames, on which they have dashed themselves, mistaking the reflection of the glass for the reflection of water.

The commonest beetles in all stagnant waters are *Hyphydrus ovatus*, *Hydroporus palustris*, *Haliplus ruficollis*, *Agabus bipustulatus*, *Hydrobius fuscipes*, and one or two *Helophori* and other *Philhydrida*. There is hardly a pond or ditch in which these are not found, and there are many others that are almost equally common; even the rarer species as a rule are rather local than scarce, and where one specimen is found many more may usually be procured by closer examination. Thus *Spercheus emarginatus*, which used to be one of the very rarest of our British water beetles, only one or two specimens from Yaxley Fen being known, was rediscovered by Mr. Billups near West Ham, where Messrs. Perkins and Champion found it in numbers. Not long ago Mr. Harris, of Burton, found the rare *Haliplus mucronatus* in abundance at Weston-super-Mare: there are however exceptions; thus *Hydroporus oblongus* and *H. Scalesianus* are always rare in Askham Bog, almost their only known locality, and *Hydroporus unistriatus*, the rarest of the *Hydropori*, seems always to occur singly at wide intervals of time. *Cybister Rœselii* has been said to have occurred at Walton, in Essex, and a specimen was formerly in Mr. Griesbach's collection, but it is very improbable that such a large beetle should have escaped notice if really indigenous, and it ought certainly not to be reintroduced into our list.

Cnemidotus impressus, the first of the water beetles in the British list, is [illegible] in [illegible] waters near Putney and Wandsworth. *Pelobius Hermanni*, *Hyphydrus* [illegible], *Hygrotus* [illegible], and [illegible] [illegible] are also insects that particularly affect the London district. The last three are much sought after for the aquarium, and used to be collected and brought to Covent Garden for sale for this purpose. The *Hydropori* are a very large and in many cases a very obscure group; the brighter coloured species, such as *H. 12-pustulatus*, *H. depressus*, *H. assimilis*, *H.* [illegible], *H. septentrionalis*, *H. pictus* and others, are usually found in running streams, accompanied by *Brychius elevatus* and also *Haliplus* [illegible], which latter insect, however, seems to be found in both running and stagnant water. The *Hydropori* that frequent the deeper parts of running streams are usually found attached to logs or stones, and sometimes may be found abundantly under stones at the bottom, after the fashion of the *Elmidae*. *Hydroporus* [illegible] is found in lakes among stones in the same way, and this perhaps explains its rarity. *Hydroporus minutissimus* is only found on the edges of the large fresh-water basin close to the sea at Slapton Ley, in Devonshire, where it was discovered by Mr. Wollaston, and with it *Limnius troglodytes*, which latter beetle, however, has been found elsewhere in numbers by Dr. Power.

The smaller *Hydropori*, such as *H. atriceps*, *H. umbrosus*, *H. tristis*, *H. obscurus*, and others, are very obscure; the majority of them may be found in Askham Bog, near York; of these and the other Askham Bog beetles I have lately given a full account in the 'Entomologist's Monthly Magazine' (vol. xviii. pp. 7—9; June, 1881), and need not again enumerate them. Some of the *Hydropori*, such as *H. lituratus*, *H. memnonius*, and sometimes *H. tristis*, seem especially to prefer small ponds in woods, while others are fond of brackish water, such as *H. confluens*, which I have found in abundance in pools at Hunstanton, within a few yards of high-water mark; others again are quite indifferent. I have found *H. lepidus* in profusion in a stream near Bournemouth, quite close upon the sand, and also in a pond in a wood near Lincoln.

The species of the genera *Noterus*, *Laccophilus*, *Colymbetes*, and *Ilybius*, with very few exceptions, are all common in stagnant waters all over the country. With regard to the *Agabi*, *A.*

striolatus and *A. tarsatus* appear to be almost unique; *A. brunneus*, found by Dr. Power in the New Forest, is very scarce, and the local Scotch species *A. congener*, *A. arcticus*, and *A. affinis*, are always in much request.

The genus *Dytiscus* is very hard to complete. *D. punctulatus* and *D. marginalis* are common, the latter extremely so, but *D. lapponicus* is a rare northern insect, and *D. circumcinctus* and *D. dimidiatus* are almost peculiar to the fens, especially Yaxley Fen and Whittlesea Mere, although a single specimen of the latter insect and a few specimens of the former have been found in Askham Bog. It is strange how rare the latter species has become. I have heard an old collector say that he has known it taken literally by pints.

The *Hydatici* are all rare, *H. cinereus* especially so; all three used to be found in the fens, especially in Whittlesea Mere, *H. seminiger* being very abundant.

The Gyrinidæ are a very obscure group, and some of our species are very doubtful; *G. marinus* and *G. natator* are very abundant, and *G. urinator* is said to be common in the north; *G. minutus* is common in Scotland, and *G. bicolor* is to be found in many places on brackish water. *Orectochilus villosus* is only found on running water, and is not often seen unless looked for close under the banks, as it comes out by night, and remains hidden by day. I have found it abundantly on the banks of the Dove, near Repton.

The School House, Lincoln.

[*Hydroporus oblongus* was *originally* found by me at Cambridge, and afterwards in the Norfolk fens.

Hydroporus latus.—I have seen in two places: one is a rapid stream, not far from Tilgate Forest; the other is a stream in Tilgate Forest. In both it was abundant: I got about 200 specimens in the two together.

Cybister Rœselii.—The specimen is now in my collection. Its authenticity is somewhat dubious, but the story of its capture, attached to it, is very definite.

Agabus striolatus.—I believe was only taken once, and that by my friend Rev. Laundy Brown, of Norwich, more than forty years ago. It was in a ditch in one of the Norfolk fens. He took about sixteen of them; six or eight are still in my possession.

Both Mr. Brown and myself have searched the same spot, but without avail.

Agabus tarsatus.—I only know of one specimen, in my own cabinet, from Orkney.—J. A. P.]

COLEOPHORA INULÆ:

A SPECIES ADDED TO THE BRITISH FAUNA.

By William Machin.

When collecting along the road leading from Dorking to Leith Hill, about twenty years ago, I found on plants of *Inula dysenterica* some cases of a *Coleophora* larva, which in due course reached the perfect state, and were named for me *C. troglodytella.* Last year, in the neighbourhood of Gravesend, I met with cases of a *Coleophora* larva on this plant, which differed so much from those above referred to that I concluded we had here two species under one name. In April last I submitted a small series of each of the above named to Mr. Stainton for his inspection; on referring to his splendid continental collection, the first-named proved to be *Coleophora inulæ,* a species new to this country; the latter being *C. troglodytella.* The two species are very closely allied, but on inspecting the insects Mr. Stainton at once pointed out the more pointed wings of the latter.

The principal difference is, however, in the cases, that of *C. inula* measuring fully 7 lines, and the case, when the larva is feeding, lying almost flat to the leaf; while that of *C. troglodytella,* which measures about 4 or 4½ lines, occupies a comparatively upright position. Both of the species occur in the larval state in June.

22, Argyle Road, Carlton Square, E., August 17, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Entomological Notes on the Season.—So far as my experience goes, 1882 has been a very dull year for the lepidopterist, and but for the breeding of several good species I should have very little to show for my labours. Three or four trips to Tilgate during May and June gave for result nine *Sesia sphegiformis,* which I bred, and four imagines taken at large. After closely watching the economy of this rare clearwing, I am perfectly convinced that it lives three years in the larval state. Although I have not reared this species from the egg, still I have kept a strict attention to certain larvæ feeding. Three weeks were spent at Deal, and although during the six years I have known them I never saw the sandhills look more promising, or ever saw vegetation more luxuriant, still Lepidoptera were but poorly represented; the usual local species were, generally speaking, far less numerous than in previous seasons. Of some species that usually are abundant there, such as *Aspilates citraria*, *Stenopteryx hybridalis*, and *Scopula ferrugalis*, which in some years are in thousands, I did not observe a solitary specimen of either species. *Acidalia ochrata* followed the rule of scarcity, not more than ten per cent. in number of last year's brood. *Nyctegretes achatinella*, too, required much more working for to get a fair series. *Acidalia emutaria* only very few; and of *Melia anella*, generally a fairly common species here, I only saw two specimens. *Lithosia pygmæola* was fairly common in third week in July; on one or two favourable nights anyone could have taken hundreds of it. One night I secured ten *Nola centonalis;* curiously three pairs *in copûla;* this, in my experience, was a most exceptional night's work: I secured fertile eggs, and have now larvæ feeding. Although I worked specially for *Scoparia lineola*, only four rewarded my search. By the sides of some rushy marsh ditches *Nonagria despecta* swarmed; one could get six or eight at one sweep of the net, and it was by far the most abundant species I met with; of course it was confined to these ditches. Some of the commoner Noctuæ were fairly abundant, but nothing of any note fell to my net. The results from my breeding-cages have been more satisfactory. In March I bred *Petasia nubeculosa* and *Endromis versicolor*, both from Scotch eggs; of the latter species, which were of a particularly fine dark type, I secured fertile eggs, and succeeded again in obtaining pupæ; about one-half of the first brood are still lying as pupæ. During June I bred a very fine series of *Dianthœcia albimacula* from the larvæ I obtained last year near Dover; this season I again worked for it, but curiously the plant from some cause was almost a failure. Where last year I could have filled a sack with flowers and seed-heads, this year I could only fill a pill-box, and not nearly sufficient to feed the four larvæ I did find. From twenty-six [illegible] [illegible] [illegible] *coronata* I reared twenty-three very fine [illegible], and obtained [illegible] eggs, which are now duly [illegible] a second brood. [illegible] [illegible]. [illegible] [illegible] and [illegible] were successfully [illegible] and bred in [illegible] and [illegible] [illegible] series of [illegible] *[illegible]*, from eggs I [illegible] [illegible] [illegible] [illegible] year. *Acronycta alni*, [illegible] [illegible] [illegible] eggs. A fine series of *Tephrosia* *[illegible]* from the egg; and during July and August I reared a beautiful series of *E. [illegible]*; also eight specimens of *Cidaria [illegible]*. This is a [illegible] species when [illegible]. These and a lot of commoner species have kept the season from being dull, as in [illegible] I would have been.—W. H. TUGWELL; Greenwich, August [illegible].

NOTES OF THE SEASON.—Early in May, on the moors, insects seemed to be in plenty. *[illegible]* was in swarms: for a bit of fun I caught six at one stroke, when they were engaged in [illegible]: I [illegible] my [illegible] if she saw any that could scarcely try to take them, as I was the less chance of getting a variety, especially of a [illegible]. It turned up as [illegible] for: one specimen shows the brown in the under wings, as in *T. [illegible]*. This is the first variety of *T. rubi* that I have ever seen. *Nemophora pilella*, only one specimen turned up: and I went again, with not much better result. However, I went again and took my son, who had not known how to follow the sun, and captured about sixty specimens. When the sun shone on a small patch of bilberry in a clearance of the fir wood, about 11 o'clock, they kept rising out of the undergrowth, and I continued finding up to 3 p.m.—places, as the sun went round, that were alive with insect life, where previously I could not see a moth; and at the spot that I visited at 11 no life was seen, hence my great catch. Early in July I paid a visit to Witherslack to get some *Chortobius Davus* for a friend: a false rush at one cut my career short, for a tendon of my right leg snapped, and I am as lame to-day as then, and likely to be so for a long time to come. However, I went to spend a week, to rest my leg, at Arnside, in Westmoreland. I managed to hobble a little, and strange to say a small moth flew past: my wife took the net, and brought back a female *Eupithecia pygmæata*. Two days later I took another, which is alive yet, and I hope to have eggs from them. This species is quite two months late. At t[illegible]e a white moth flew past, which was *Emmelesia* *alchemillata*, fresh as just out of pupa. This species I took worn early in May this year. Soon after I took *Bucculatrix aurimaculella*, another early species. Among the *Rosa spinosissima*, *Penthina incarnatana* was not rare. Among the *Helianthemum*, *Laverna miscella*, *Butalis fuscoæneella* and *Gelechia sequacella* were in plenty. Towards 7 in the evening another tribe began to appear, viz., *Elachista biatomella*, *E. eleochariella*, *E. bedellella*, and *E. adscitella*. A little higher up *Erebia Blandina* was in swarms; so were *Larentia olivata;* but being able only to go at snail's pace, I had to be content with odd ones that came near me. Among the *Hypericum*, *Gelechia atrella* turned up; and among dead sticks *Œcophora fuscescentella* appeared, worn as usual. I sent my son to Windermere for *E. conspicualis*, but he did not see a specimen; and only one worn *Emmelesia tæniata:* the heavy rains and cold weather made a moth of any sort a treat to see. He only got about six moths, and some of those were "pea-green's" (*Tortrix viridana*) washed white. I succeeded in breeding *Emmelesia tæniata* from the egg. Its life-history I will send you some day.—J. B. Hodgkinson; 15, Spring Bank, Preston, August 13, 1882.

Remarks on the Season.—The present scarcity of Lepidoptera has led several of your correspondents to comment upon the subject. I should also like to add a few remarks, so far as my personal experience will permit. In New Malden neither June nor the early part of July have yielded me half a dozen specimens worth recording, although I have worked diligently with the net at twilight, sugared favourite trees, and later on searched the gas-lamps. Whilst speaking of the last mode of collecting, perhaps one capture is worthy of notice:—On July 14th I took *Orthosia suspecta*, a species I have never known to occur in this village before. The season, as a whole, in this part of Surrey, I believe, is one of the worst known for many years. Now, bearing this fact in mind, it does seem strange that the horticulturist should be justly entitled to complain of his insect enemies. Nevertheless it is so; for *Aphides* have occurred in enormous numbers, attacking vegetation in many of its varied forms. To give an idea of their abundance,—just imagine the trunks of oak trees altered in colour, and the ground for some few inches around the base of each raised two inches above its normal level by a moving mass of animated nature; then will one be able to conceive what the writer witnessed in Coombe Wood during the hot morning sunshine of July 2nd. Having briefly referred to the unwelcome result of insect hunting in this neighbourhood, it is refreshing to be able to report more favourably of day-flyers seen or taken during a visit to the New Forest, extending over the last eight days of July. Here *Argynnis Paphia* was out plentifully, but its variety, *Valezina*, wanted much looking for. *A. Aglaia* and *A. Adippe* were in fine condition. *Leucophasia Sinapis* and *Rhodocera rhamni* were splendidly fresh; the latter could be taken by scores. *Melanagria Galathea* occurred but sparingly. The genera *Pyrarga, Satyrus* and *Epinephele* were represented by all their members, except *S. Megæra;* while the *Lycænæ* could produce but one species, viz., *L. Argiolus.* Among the "skippers," *Hesperia sylvanus* and *H. linea* were common; as also were *Pieris napi* and *P. brassicæ,* although *P. rapæ* was conspicuous by its complete absence. To sum up in a word, I took or saw in two days, consecutively, twenty-one species of Diurni, which is as much as could be reasonably expected from our limited list, even if the season were a first-class one. Had the other modes of collecting been equally prolific, I should have had no cause to complain of my visit; but in no other means that were adopted could I get a trace of success: beech, birch and sallows were beaten for hours without producing a solitary larva. The net was used at twilight for Geometræ, without taking upon an average one specimen each evening. Sugaring at Boldre Ford did not necessitate opening the bottle; and after several night's work of the same description, in company with Mr. A. Mitchell, in Holland's Wood, we could only count up twelve species of Noctuæ between us. *Cosmia trapezina, Amphipyra pyramidea* and *Triphæna pronuba* were the most abundant; *Catocala promissa* appearing but twice. In addition to the Noctuæ our sweets attracted *Lithosia quadra* and one *Cossus ligniperda.* One *Triphæna subsequa* was turned up from grass in the daytime by my companion, who fortunately secured it. Of the Micro-lepidoptera I can say nothing, for it was difficult to find twice as many species as there are inns in Brockenhurst, where the weary collector can rest and refresh himself without being considered the follower of a mere childish pursuit, but will be regarded as a student of an interesting branch of Science.—H. T. Dobson; New Malden, Surrey, Aug. 11, 1882.

GREAT SCARCITY OF LEPIDOPTERA.—I can bear testimony with others as to the scarcity of Lepidoptera this year. I have hunted regularly and carefully, with but indifferent success; species which used to abound here I cannot meet with. For example, *Anarta myrtilli* is common in two parts of the Quantoch Hills, but this year I have not taken a single specimen. In this connection let me mention a curious fact, which I should be glad to have explained. For three weeks previous to the setting-in of the wet weather in June I "sugared" regularly in my garden, three or four nights a week. Noctuæ were plentiful, several times there was a "very crowd." Among others I took *Thyatira batis*, one specimen of *Cymatophora ocularis* in excellent condition, *C. ridens*, and *Dianthœcia carpophaga*. From this I anticipated a good season; but a week after the wet weather set in every *Noctua* disappeared; and to this day, though I have "sugared" most perseveringly, I have seen but one single moth at sugar, and that a *Triphæna pronuba*. The total disappearance was as sudden as unaccountable, at least to me.—[Rev.] J. SEYMOUR ST. JOHN; Crowcombe Rectory, Taunton, August 15.

SCARCITY OF INSECTS.—Probably the oldest collectors will agree with me that this season so far has been the very worst, as far as Lepidoptera are concerned, within the whole range of their experience. Such unquestionably has been the case in the south. Perhaps some one will favour your readers with the state of matters in the North of England or Scotland. Has the mild winter allowed the enemies of our lepidopterous insects to increase to such an extent as to threaten their extermination? How does it happen that one of the severest winters on record, *viz.*, 1879–80, was followed by an exceptionally good season for insects, and one of the mildest winters by one of the very worst seasons within our recollection?—W. MCRAE; Bournemouth.

MELITÆA ARTEMIS IN NORTH DEVON.—In Mr. South's notice of captures in North Devon I see he does not mention *Melitæa Artemis*. My brother found two of the larvæ near here on the 18th April; they became pupæ on the 27th, and produced fine females on the 23rd and 24th May. On the 29th May, Miss Hinchliff and I took our nets to the marshy field where the larvæ had been found, and, on that and the following day, caught over seventy fine specimens. We could have taken many more.—[Mrs.] *F. S. MATHEW*; Instow, North Devon, July, 1882.

SPHINX PINASTRI.—As Editor of this magazine I have received the following letters, which will speak for themselves. Is it possible these correspondents have come across an instance of the amateur colonisation referred to (Entom. xv. 114) by me recently?

July 20.

Dear Sir,—I wish to call your attention to the capture of several pairs of *Sphinx pinastri* (in one of the eastern counties) by myself and friend during the present month, and would be glad of some information as to how to dispose of them to collectors, not being an entomologist myself. I can give the highest references in the neighbourhood as to their genuineness.

July 21.

Dear Sir,— Two friends and myself have taken some specimens of *Sphinx pinastri* in this county during the last fortnight. We are desirous of selling some of them. If a short paper on the subject of the occurrence of this rare insect would be of use to 'The Entomologist' I shall be happy to write and send you one. I would offer these insects at per pair, and perhaps you will kindly let me have your opinion as to what amount should be asked.

I have omitted the writer's names, not having their permission to insert them.—J. T. C.

ACHERONTIA ATROPOS IN LONDON.—On the 2nd of May last the brother of a friend took, on the window-sill inside the office of a stockbroker near the Royal Exchange, City, a large specimen of *Acherontia Atropos,* which had, from its worn appearance, probably been hybernating in or near the office.—T. SAYER; 53, Ladbroke Grove Road, Notting Hill, W.

EUPŒCILIA FLAVICILIANA.—On July 16th I captured, in St. Margaret's Bay, a short series of this very local species. I did not find the exact spot for them until the last night of my stay, or probably I should have secured a longer series. As some of the specimens are rather worn, it would appear that quite a week earlier than this date would be the proper time to get them in fine condition. During a visit of sixteen days' duration I tried sugar, and the natural attraction of the flowers, with very poor success. The only moth that came in any numbers was *Agrotis exclamationis,* with an occasional *Xylophasia sublustris* to vary the monotony of the evening. *Callimorpha dominula* was in its usual abundance, but an examination of some hundreds failed to produce any varieties worth mentioning.—J. A. COOPER; 22, Bingfield Street, London, N., August 11, 1882.

STATHMOPODA PEDELLA.—One windy day in July last I was beating about on the lee-side of a long clump of alders in Suffolk with the hope of stirring out any Lepidoptera there might be sheltered among the foliage, but after nearly an hour's hard work I had only captured a few insects, none of which were worth retaining. In the field was a solitary alder tree, the top of which at some time had been broken off; around the stem was a tangled mass of young alder shoots and bramble, among which, on the ground, a quantity of *débris*, including plenty of last year's fruit, had collected. Although I did not expect to get anything from this particularly exposed tree, after so unsuccessfully working the more sheltered clump, I was surprised to find two queer-looking insects in my net, the result of the first beat. I at first thought they belonged to the coleopterous order, but, having boxed them, I found that they were true Lepidoptera, which I subsequently made out to be *Stathmopoda pedella.* The curious habit this insect has of bringing the hind pair of legs forward and sticking them out at right angles with its head, like antennæ, in conjunction with its shape, coloration, and markings, are so suggestive of a beetle, that one might easily mistake and consider it a coleopteron. Subsequent visits produced in all seven specimens from the tree; one only, a wasted specimen, from the clump of alders.—RICHARD SOUTH; 12, Abbey Gardens, St. John's Wood, N.W.

NOTES ON THE TIME OF APPEARANCE OF SOME RARE WATER-BEETLES.—I have often been struck with the vagueness of our information as to the time of year when our water-beetles are to be found; moreover, when I have found any information my experience has frequently contradicted it. Consequently I resolved this year to make some accurate notes as to the time when the rare *Hydradephaga* of Askham Bog appeared, when they were most abundant, and when they ceased to be found. I have made many visits to the bog since January, and kept a very close account of my captures, with the following results:—*Hydroporus Scalesianus.*—This insect, which I believe is in this country confined to Askham Bog, appeared as early as February 9th, when I took two specimens; on March 17th it was abundant, and after that became scarcer by degrees. *H. oblongus.*—One specimen appeared on February 11th; in the middle of March it was frequent; in April it became scarce, and could not be found after

May 22nd. *H. rufifrons.*—This species, unlike the two preceding, exists through the whole year, except perhaps in July; even on January 3rd it was abundant; on March 9th, after heavy rain, it appeared in prodigious quantities on the flooded ground: it only occurs in very shallow and temporary puddles. *Agabus abbreviatus* appeared on February 9th, became most abundant on March 11th, and continued so till May. *A. uliginosus* was abundant as early as January 3rd; in March it became less common, but it exists all through the year, and is specially abundant in September. *A. agilis* appeared on February 11th. *Dytiscus dimidiatus.*—I believe this fine beetle has not before been recorded from Yorkshire; I took one male on March 11th. *Colymbetes Grapii.*—This species appeared on March 9th, when I took one specimen; after this a few turned up at every visit till midsummer. *Hyphydrus ovatus* appeared on March 17th, and soon became abundant. I think these observations show us that many of the *Hydradephaga* appear much earlier than is commonly supposed; moreover, the rarest species appear to be the earliest. Is it possible that they are not so rare as is commonly supposed because they have a very short season, and that at a time when pond-collecting is generally neglected?—W. C. HEY; York, August, 1882.

[In accordance with Archdeacon Hey's observations, I have always found the rarest aquatics (water-beetles have from the earliest days been my pets) in very early spring, such as *Hydroporus nitidus* (which I was the first to discover), *H. unistriatus*, *Agabus uliginosus*, &c., which I used to get with many others at Cambridge. *Hydroporus neglectus* I used to get at Lee when the snow was on the ground; in June and July I found them all but disappear, but in August and September many, if not all, again appear; and I was once only at Askham Bog for three hours, with the archdeacon, on August 13th, 1872, and found, of those he mentions, *Hydroporus Scalesianus* pretty abundant (I have recorded seventeen), *H. rufifrons* and *decoratus* in profusion, *H. tristis* common enough, *Agabus abbreviatus* plentiful, and *A. uliginosus* in fair numbers (I got about twenty). The more common species were plentiful.—J. A. P.]

COLEOPTERA AT SHERE.—By sweeping some rough grass under a hedge last week I obtained a specimen of *Cissophagus h*[illegible]hmidt. This insect, though included in Mr. Cox's handbook, is not mentioned either in Dr. Sharp's list or in the more recent one by Mr. Francis Pascoe, just published. It may not have been discovered in Britain prior to the date of Dr. Sharp's, but I see no reason for its being omitted in Mr. Pascoe's, as there can be no doubt of its being a native. I have also met with the following Coleoptera in this neighbourhood during the past summer:—*Lissodema cursor*, *Agrilus angustulus*, *Atemeles emarginatus*, *Lyperus flavipes*, *Melanotus castaneipes*, *Callidium violaceum*, *Erirhinus tortrix*, *Mantura obtusata*, *Prionus coriarius*, and *Megacronus cingulatus*. On the whole, however, insects have been scarce this season, more especially the aculeate Hymenoptera and the Ichneumons.—EDWARD CAPRON, M.D.; Shere, Surrey, August 14, 1882.

NOTES ON THE LIFE-HISTORY OF PHÆDON TUMIDULUM, *Kirby*.—Wishing to ascertain if *Heracleum Sphondylium* was really the food-plant of this beetle, I commenced searching early in the spring in the hope of finding eggs deposited on the plant. In this, however, I was disappointed; but on the evening of May 7th I came upon a colony of some hundreds of tiny black coleopterous larvæ feeding on the under side of the leaves, and from their general resemblance to certain phytophagous larvæ with which I am acquainted I concluded they were those of *Phædon*. Even here I failed to detect the vestige of an egg, although, judging from what they had eaten, the larvæ had been hatched but a very short time. The spot being unlikely to be disturbed, I resolved to leave the little grubs on the growing plants until I thought them about full-fed, at which time I secured about a dozen of the largest, and placed them in a jar with food, and a layer of earth at the bottom. Some of them continued feeding, but others burrowed at once, and the first beetle emerged on the 29th of June. Thus it is probable that in their natural state they pass from the egg to the imago in about eight weeks When first discovered the young larvæ were dull black, but became lighter with each successive moult, until they were of an olive-green, with head, legs, and tubercles (of which there were four on each segment) shining black. When full-fed they descend to the ground, burrow, and change to pupæ. These latter are pale yellow at first, but eventually become of an ochreous colour, very convex above, head depressed, legs lightly folded against the thorax, and the wings and elytra brought round under the abdomen. The newly-emerged beetle is pale yellow, with two black spots, sometimes confluent, on the thorax, but the insect does not appear to leave its burrow until it has assumed its normal tint of metallic-blue or bronze, which is effected in the course of a few hours. The above confirms the opinion to which I gave expression at page 24 of the present volume, but it remains to be seen whether or not hog-weed is the only food-plant of this insect. With regard to the other species, *P. cochleariæ* has bred as usual in a watercress-bed, and also attacked some radishes in my garden, but as yet I have failed to detect *P. betulæ* (Sharp's Cat.) anywhere. — Thomas H. Hart: Kingsnorth, Ashford, Kent, July 4, 1882.

Description of the Larva of Lemophlœus ferrugineus, *Stephens*.—So little is known about the larvæ of British Coleoptera that I think any information respecting them should be at once recorded, and therefore I send you a description of the larva of *Lemophlœus ferrugineus*, Steph., a species, the larva of which has not hitherto been described, and which I have recently reared upon the cork of a bottle containing British Mollusca in spirits of wine. The larvæ were discovered in some numbers tunnelling the cork in all directions. Long, rather narrow and depressed, slightly convex above, flat below, of a pale yellowish white colour, except the head and last segment, which are brownish yellow. Head a little broader than long, flattened, sparingly covered with short silky hairs, strongly emarginate behind, anterior and lateral margins rounded, posterior margin usually hidden beneath the first thoracic segment, although the larva has the power of projecting the head considerably beyond it; marked with a narrow brown stripe, commencing at each side of the base of the labrum and continued to the posterior margin; labrum small, nearly semicircular; mandibles short, strong, and simple; labium clothed with minute hairs; labial palpi very small, composed of two joints, the second being slightly the longer and thickened at the apex; maxillæ short, incurved, lobe small; maxillary palpi four-jointed, of which the first three are equal in length, the fourth being narrower, and as long as the second and third together; antennæ formed of four joints, the basal large and broad, the second much narrower and not so long, the third as long as the two first, gradually thickening towards the extremity and bearing a minute spinous excrescence at its apex, the fourth narrow and not quite so long as the preceding. Thoracic segments semitransparent, sparingly covered with hairs, anterior angles rounded. Abdominal segments increasing in width until the fifth is reached, when they rapidly decrease; the eighth longer than the others, having the posterior angles very obtuse; anal segment narrow, and terminated by two sharp rigid spines, in some specimens slightly curved inwards. Nine pairs of stigmata. Legs well developed, and covered with fine hairs; claws small, simple, and sharply pointed. Length, 4 mm.; greatest width, ⅔ m. This larva is easily distinguished from that of *Læmophlœus Dufourii*, Laboulbène (described by M. Edouard Perris in the Ann. Soc. Ent. France, 3rd series, vol. i., p. 618), by having the posterior margin of the head concave or arcuate, instead of straight. It also differs in this particular from the larva of *L. ater*, Oliv. (*Cucujus spartii*, Curtis), a figure and short description of which appeared in Westwood's 'Introduction to the Modern Classification of Insects,' vol. i., p. 146. The larva of *L. ferrugineus* is very distinct from either of those of the above-mentioned species, but space does not admit of my entering into minor differences; they will, however, readily be made out upon reference to the original descriptions.—H. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, N.W., August 12, 1882.

[Compare Carpentier's note on the larva of *Læmophlœus ferrugineus* in Bull. Soc. Linn. de la Nord du France for April, 1877.—E. A. F.]

LIMNERIA KRIECHBAUMERI, *Bridgman.*—This Ichneumon I have bred from the larva of *Tæniocampa stabilis*, and it always emerges when its victim is nearly ready to moult for the fourth time. Its cocoon is oval in shape, and of a chocolate colour, with a central whity-brown zone, and is 6 mm. in length and 4 in breadth. The object of my writing this note is to record the very strange propensity the pupa has of jumping. I first noticed this peculiarity about sixteen years ago; since that I have often exhibited it to my non-entomological friends as a "curious jumping seed." I have known it to jump four feet in a horizontal direction, and about two feet when a perpendicular bound has been tried. I have closely watched it many times, but could never see any preparation by contraction or otherwise before the jump; and from experiments I have made with cocoons I am fully convinced that the jumping is done to secure for themselves shelter during the time the species is in pupa, for I find if they are taken from the leaf and placed in moss they soon work themselves down by rolling from one side to the other, but if placed in a box the jumping continues many days; and I have every reason to believe that they get so exhausted with the effort that they seldom come to maturity. *L. Kriechbaumeri* escapes from its victim, while the larva is on the tree, in the beginning of June, and does not emerge from the cocoon until the following April. I believe it confines its attacks to *T. stabilis;* so far I have not obtained it from anything else.—G. C. Bignell; Stonehouse, August 7, 1882.

External Parasites of Spiders.—Mr. Fitch, in his paper on this subject (Entom. xv. 169), does not mention the exhibition, at the meeting of the Zoological Society on February 15th, 1881, of examples of *Acrodactyla degener*, Haliday, bred by myself in the preceding year from larvæ adhering to the outer surface of the abdomen of two species of spider,—*Linyphia obscura*, Bl., and *L. zebrina*, Menge. The empty cocoons and spiders were also exhibited. Fuller details of the above were published in April, 1881, in 'Spiders of Dorset,' part ii., p. 579, by the present writer. The name of the parasite was, by a clerical error, given as *Acrodactyla Degeerii;* corrected, however, in the "errata." These larvæ are in some seasons very abundant: I have found them not only on the above-named spiders, but on several species of *Theridion*, as well as on other species of *Linyphia*, and on some *Epeirids*. It is possible that more than one species of parasite has been concerned, though all the larvæ which have come under my own notice appeared to be identical. Mr. Parfitt seems to have been under the impression that the larva from which he bred *Acrodactyla degener* was an internal parasite, obliged to come outside owing to the body of the spider not being large enough to contain it. This is, I think, a mistake. These external parasites are probably hatched from eggs affixed to the outer surface of the spider's abdomen, or at any rate very slightly inserted.—(Rev.) O. P. Cambridge; Bloxworth Rectory, August 1, 1882.

Erratum.—At p. 190, vol. xv. of Entom., for *Cœnonympha Davus* read *Chortobius Pamphilus*.

THE ENTOMOLOGIST.

Vol. XV.] OCTOBER, 1882. [No. 233.

OBSERVATIONS UPON OUR PLANT-MINING AND GALL-MAKING DIPTERA AND HYMENOPTERA IN 1882.

By Peter Inchbald, F.L.S.

March 10th. — The deflected rosettes on small bushes of *Salix capræa* gave forth their tenants, which continued to emerge during the whole of the month of March. The gall-gnats bear considerable resemblance to *Cecidomyia rosaria* of the vertical rosette, which is fully a month later in putting on its wings. The deflection of the branches that bear the rosette is very remarkable, the stems sometimes offering the appearance of a loop. One bush gave me a score such deflected leaf-tufts, and not a single upright one was visible on the bush.

March 24th. — A hymenopteron (*Cryptocampus pentandræ*, Retz.) first emerged from woody galls of *Salix pentandra*, a somewhat local northern willow. The galls, which vary in size from a hazel-nut to an almond, contain about ten tenants, which exist as larvæ till the winter, pupating in the spring of the year. They continue to appear as imagines during March and April. According to Mr. Fitch the *Cryptocampus* is identical with the one described so accurately by Thomson. I bred nearly a hundred from the galls I had gathered before the winter.

March 26th.—*Cecidomyia betulæ* came forth in fair abundance from the catkins of the birch of the previous year. It utilises the winged seed as food and shelter, modifying it to its wants. The pupa is enclosed in a thin, white, papery case. The imago puts on wings between 7 and 8 o'clock a.m., if the morning be bright and sunny. I saw several emerge, and in about half an hour the transformation-scene is at an end. The termination of the oviduct of the little red gnat is white, as stated by Walker.

Like so many of the *Cecidomyidæ*, it is very lively in its movements.

March 29th.—Sent to Dr. Meade specimens of a miner of the Tartarian honeysuckle that came forth this day from its pupa in the mine, where it had remained inactive since July, 1881. Dr. Meade says, in a letter dated March 31st, "The little miner of the honeysuckle leaves appears to be an example (female) of the *Agromyza geniculata*, Fallen. Nothing is recorded of its life-history, and it is said to be rare."

March 30th.—A little *Cecidomyia* emerged from deflected rosettes of the true *Salix repens*. The rosettes or leaf-tufts are very small, but beautifully symmetrical. I can hardly consider it as identical with our old friend *C. rosaria*, though quite aware that it is apt to be modified by circumstances so far as size and contour. Another insect-problem that has yet to be satisfactorily solved!

April 25th.—The first gall-gnat, the true *C. rosaria*, emerged from the vertical leaf-rosettes of *Salix capræa*, upwards of a month later than the reputed *C. rosaria* that came forth from the deflected rosettes on the same species of willow.

May 4th.—Cecids emerging from the vertical (all) rosettes of *Salix alba*. Modification of the long narrow leaves of this species to the exigencies of the tenants. Reputed identity between the two imagines.

May 13th.—Bar-winged fly (*Trypeta cylindrica*, Desvoidy) bred from the seed-heads of *Centaurea nigra*. Feeds, according to Loew, on the seeds or receptacle of various Composites on the Continent. Pupa lies *loose* and exposed among the fluff, short and tufted, of the seeds.

May 31st.—Another gall-gnat (*Cecidomyia salicis*) coming from the woody branch-galls of *Salix cinerea*. The terminal and lateral branches are both galled, the gall appropriating the sap that should have supported the shoots, which frequently perish in their efforts to subsist. Dr. Meade remarks, in a letter to me, "This species is very similar to *C. rosaria*, but has a little tuft of white hairs over the mouth."

June 3rd.—Both *Cardamines* (*pratensis* and *amara*) giving evidence of their flowers serving as food to the larvæ of *Cecidomyia cardaminis*. Flowers distorted by the larvæ. Styles, stamens, sepals, petals, capsule, all showing the effects of their depredations. *Cardamines* so affected growing on wet and spongy ground. The white petals of *C. amara* assume the deep purple hue of *C. pratensis,* so that it is difficult to distinguish between the species except by the leaves. I am looking for the imagines to put in an appearance in April of 1883. Winnertz reared the little gall-gnat in 1853. After many fruitless attempts he says he reared forty-nine males and forty-six females.

June 4th.—Bedeguar Cynips (*Rhodites rosæ*) emerging very abundantly from the mossy tufts on the stems of *Rosa canina* of the previous year. Bred upwards of two score. Very few apparently were ichneumoned last autumn.

June 7th.—The tenants of the stunted acorns of *Quercus pedunculata* prove to be *Synergus evanescens.* Mr. Fitch kindly forwarded the insect, for more perfect recognition, to Dr. Mayr. It is thus *not* the original house-builder, but simply a tenant! Its habits of life are peculiar, and certainly need closer observation in England. I bred nearly a hundred of both sexes of the *Synergus evanescens.* The original builder is not known.

June 10th.—The tendrilled leaves of the pea mined artistically by the larva by *Phytomyza affinis,* Macquart, the *P. nigricornis* of Curtis. The pupa-case is imbedded at the end of the mine. I noticed the emerging of the imago from the mine very early in the morning. Wings long in expanding.

June 19th.—In January last Mr. Bloomfield kindly sent me, from the Sussex coast near to Hastings, dipterous wens that were obtained from the thistle (*Carduus arvensis*). These were tenanted by the pupæ of a Urophora (*Urophora Cardui*), as their markings distinctly showed. I put them into a glass-topped box, occasionally moistening them with water so as to assimilate Nature in her ways and means. Just before midsummer-day the tenants of the gall began to emerge. I bred fully fifty, with a large proportion of females.

June 21st.—Galled heads of the hardhead (*Centaurea nigra*) accompanied the thistle-galls, and these gave me an abundant progeny. I would remark that the economy of this bar-wing (*Urophora solstitialis*) differs from that of *Trypeta cylindrica,* which frequents the same flower-heads, inasmuch as the latter always pupates *without* any hard woody gall, the former invariably shrouds itself in a hard case, being the outcome of the seeds or *receptacle.*

June 30th.—Bred the beet-fly (*Anthomyia betæ*) from another of the [illegible] [illegible] the [illegible] [illegible], from Conway [illegible] [illegible] [illegible] [illegible]. This makes the [illegible] representative of the [illegible] that has been tested by me.

July 7th.—The mines [illegible] the snowberry-leaves (*Symphoria racemosa*) are by the *Phytomyza* [illegible] of [illegible] in fair abundance. [illegible] [illegible] [illegible] [illegible] species [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] under the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] might be at that time. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the larva in feeding [illegible] [illegible] [illegible] [illegible] [illegible] much after the fashion [illegible] [illegible] [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] the [illegible]. The mines, when [illegible] [illegible] in the [illegible] of the [illegible], are much contorted and white.

July 10th.—The leaf-mines of *Ranunculus repens*, and beautiful mines they are, [illegible] the *Phytomyza* [illegible], but not in any abundance. The pupæ are of a bottle-green colour. The larvæ [illegible] [illegible] coming forth from the mine and attaching their [illegible] to the sides and bottom of the glass-topped box. It is possible that the pupæ missed the necessary moisture, for the majority only partially emerged. The flies are yellow in colour, and very [illegible].

July 20th.—Onion flies beginning to issue in some plenty from pupæ. The species that affected our onion-beds here is *Chortophila* [illegible]. This fly was known to Goureau as affecting the onions on the Continent. The larva gradually reduces the plants into a stinking mass. Pupates below the sod near the roots, and flies on wing in due course. Dr. Meade, in a letter dated the 27th of July, states that he has bred from them two *Chortophilæ* distinct from mine, viz., *C. cilicrura*, Rondani, and *C. varicolor*, Meigen. These facts show, he adds, "that the onion tribe is preyed upon by several species of *Anthomyiidæ*, so that none can be called *par excellence* the onion-fly."

July 24th.—Bred the beet-fly from another of the Chenopod tribe (*Atriplex triangularis*), found as a food-plant on the Sussex coast. This discovery, by Mr. Bloomfield, was briefly noticed in 1880, though the species of *Atriplex* was not truly named. The more I look into this beet-feeder and its food-plants the more I am convinced that it is not very particular as to the food-plant, if it savour of the Chenopod tribe.

July 26th.—Parasites bred from the snowberry-miner. They are named by Mr. Fitch *Colastes braconius*, Haliday. Brischke, he remarks, has also bred it from leaf-miners.

July 31st.—*Phytomyza albiceps*, bred from larvæ that fed on the ragwort (*Senecio jacobæa*), covering its leaves with its pretty white mines. It is one of the most polyphagous of the group, according to Scholtz and Hardy; Hardy, indeed, bred this fly from both ragwort and groundsel. It bears a close resemblance to *P. affinis*, and it may be, as Dr. Meade remarks, only a variety of that species.

August 1st.—*Cecidomyia veronicæ* emerging from the woolly leaf-galls of the speedwell (*Veronica chamædrys*). I bred this gall-gnat so early as September, 1860. I have noticed the *Veronica serpyllifolia* apparently galled by the same gnat as is *V. montana* on the Continent. The larvæ pupate within the pair of woolly leaves that terminate the stem.

August 4th.—Grubs of the "carrot-fly" (*Psila rosæ*) apparent in the affected roots. Larvæ worming the root and protruding from the tunnels made thereby. Larvæ all pupated within the soil before the 20th of the month. Noticed upwards of a score, which may give forth the imagines in September or remain in pupahood till the spring of next year. It would seem that several generations of this fly occur during the year. Pupa-case pale ochreous, with slightly darker tips. Smaller than that of the onion-fly.

August 5th.—Willow sawfly (*Nematus croceus*) put on wings. I found the larvæ feeding on the goat willow (*Salix capræa*) on the 4th of June. They pupated on the 10th, and the imagines began to put in an appearance at the close of July and beginning of August. The larvæ much resemble the gooseberry sawfly larvæ, but the colours are more bright and vivid. The imago is larger than that of the gooseberry-fly, and of a saffron-yellow. Vollenhoven figures it under the name of *N. trimaculatus*, a not inappropriate name.

August 23rd.—*Helichrysum* leaves mined by some dipteron. Mines have a great resemblance to those of *Phytomyza albiceps*, and I quite expect that it will prove to be that species, which is so truly polyphagous. I believe the species of *Helichrysum* is *bracteatum*.

August 28th.—Hatching of *Cecidomyia veronicæ* from another of our native speedwells (*V. serpyllifolia*). The larvæ feed between the thickened upper leaves and pupate therein. *V. serpyllifolia* is a smooth species, so that the nidus is free from the woolliness so visible in that of *V. chamædrys*.

Fulwith Grange, near Harrogate, Aug. 31, 1882.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. III.—CRYPTIDÆ (*continued*).

Stilpnus, *Grav.*

A. Abdomen black; antennæ with seventeen joints.
a. Trochanters black (female).
Femora and tibiæ red; aculeus exserted, but very short. 2. *deplanatus*, 1½ line.
b. Trochanters red (males and females).
* Legs red; coxæ more or less black. - 1. *gagates*, 1⅓—2 lines.
** Legs red. - - - - - - - 3. *pavoniæ*, 1⅗ line.
B. Middle of abdomen red, sometimes black (females).
a. Flagellum of antennæ 15-jointed. - - 5. *blandus*, 1½—2 lines.
b. Flagellum of antennæ 14-jointed. - - 4. *dryadum*, 3 lines.

Gravenhorst, who described four species, placed this genus in the Ichneumonidæ, but remarked on its affinity to some of the smaller species of *Cryptus* and *Phygadeuon*, and to *Hemiteles*. Most recent authors, following Taschenberg, have included *Stilpnus* in the Cryptidæ, although it has not an exserted ovipositor. Haliday says: "This genus is more allied to *Hemiteles* than to any other Ichneumonidæ; the males of *Stilpnus*, and some species of *Atractodes*, are also very similar" (Curt., Brit. Ent., 388). In the 'Annals of Natural History,' Haliday described sixteen species of *Atractodes*, and of his *A. vestalis* writes: "This species might perhaps with equal reason be referred to the genus *Stilpnus*; indeed any definite line drawn between these two genera must be arbitrary" (vol. ii., p. 118; 1839). Thomson carries out these views when he unites *Stilpnus* and *Atractodes* in his tribe Stilpnina, which follows his Hemitelina (Opusc. Ent., 468). The species, which are difficult to differentiate, are not rare in Britain. *S. dryadum* is beautifully figured by Curtis (Brit. Ent., pl. 388), and is outlined in Vollenhoven's 'Schetsen' (pt. 1, pl. i., fig. 4). Unfortunately but little is known of the biology of this genus.

Ir. E. A. Butler bred one specimen of *S. deplanatus* from a silky hite cylindrical cocoon, with an opaque white girdle round its entre, which was 3 lines long. The host was a lepidopterous arva, feeding on honeysuckle, collected in Brecknockshire. rischke says that *S. gagates* is a parasite of *Anthomyia adicum*. The fact of a species being bred from a cocoon shows hat the genus does not belong to the Ichneumonidæ.

PHYGADEUON, *Grav.*

SECTION 1.—Scutellum and abdomen black.

A. Antennæ entirely black (females).
a. Metathoracic areæ complete and distinct; 1st abdominal segment aciculate.
* Front legs black, hind ones partly chestnut; aculeus only just exserted. - - - - - - 4. *flavimanus*, 3½ lines.
** Legs red, hind coxæ brown; aculeus about one-fourth of abdomen. 1. *caliginosus*, 2½—3 lines.
b. Metathoracic areæ not complete; legs red, hind coxæ darker; 1st segment partly aciculate; aculeus about one-fourth of abdomen. 60. *corruptor*, 2½—3 lines.
B. Antennæ red at the base, not white-ringed (females).
a. Metathoracic areæ complete and distinct.
Metathorax bispined; 1st and 2nd segments polished; femora and tibiæ red, apex of hinder blackish; aculeus nearly half of abdomen. - - - - - 36. *afflictor*, nearly 3 lines.
b. Metathoracic areæ not complete and distinct.
* Coxæ and trochanters black; aculeus only just projecting. 41. *cephalotes*, 3⅓—3½ lines.

Note.—Gravenhorst says of the antennæ, "6–9 supra albidis"; but Taschenberg makes no mention of the whitish marks.

** Legs red; antennæ red-brown; aculeus half of abdomen. 59. *brevicornis*, 3 lines.
C. Antennæ white-ringed (females).
a. Metathoracic areæ complete and distinct.
1st segment aciculate; greater part of femora and tibiæ red; aculeus about one-fifth of abdomen. - 3. *nigrita*, 2⅔ lines.
b. Thoracic areæ not complete.
Coxæ red; aculeus rather more than half of abdomen.
* Inner orbits white. - - - - - 61. *oviventris*, 3 lines.
** Inner orbits black.
‡ Hind tarsi pale-ringed. - - - - *tarsatus*, 3—4 lines.
‡‡ Hind tarsi not pale-ringed. - - - 67. *fortipes*, 3½ lines.
a. Metathoracic areæ complete and distinct.
D. Antennæ black (males).
a. Metathoracic areæ complete and distinct.
* Supero-medial area broader than long, or as broad as long, hexagonal.
† All the coxæ and trochanters black.
‡ 1st segment of abdomen very broad and strongly keeled.
3. nigrita, 2½ lines.

‡‡ 1st segment much narrower and scarcely keeled.
4. *flavimanus*, 2⅕—2⅓ lines.
†† Front coxæ and trochanters pale, hind ones black.
62. *nycthemerus*, 3—3½ lines.
††† All the coxæ and trochanters whitish to pale yellow.
61. *oviventris*, 2⅔ lines.
** Supero-medial area broader than long, almost semicircular.
1. *caliginosus*, 2⅕—2½ lines.
*** Supero-medial area distinctly longer than broad.
37. *cinctorius*, 2½ lines.
b. Metathoracic areæ not complete and distinct.
Metathorax with two cross lines: supero-medial area not closed at the sides.
* Hind tarsi not white-ringed. - 41. *cephalotes*, 3⅓—3½ lines.
** Hind tarsi distinctly white-ringed. - - *tarsatus*, 4½ lines.

Section 2.—Scutellum pale; abdomen black.

Female. - - 37. *cinctorius*, 3—3⅔ lines.

Section 3.—Scutellum pale; abdomen red and black.

A. Metathoracic areæ incomplete (females).
Antennæ tricoloured; aculeus more than half the length of the abdomen.
a. Abdomen red, apex black. - 44. *congruens*, 3—4⅕ lines.
b. 1st to 3rd segments of abdomen red. 43. *graminicola*, 2½ lines.
B. Metathoracic areæ complete and distinct (males).
Supero-medial area never quadrate; middle of abdomen red; face white-marked.
a. Front coxæ dark.
* Metathorax without spines. - - 16. *cretatus*, 2⅔ lines.
** Metathorax with very prominent spines. 22. *pumilio*, 2½—3 lines.
b. Front coxæ and trochanters pale. - 21. *larvatus*, 3½ lines.
C. Metathoracic areæ incomplete or indistinct (males).
Supero-medial area, if present, quadrate; face and mouth yellowish or pale-marked.
a. Antennæ white-ringed. - - - 44. *congruens*, 5 lines.
b Antennæ not white-ringed.
* Middle of abdomen red; tibiæ red, apex of hinder black.
† Front coxæ and trochanters pale. 53. *arridens*, 2½—3 lines.
†† Front coxæ and trochanters dark. 51. *jucundus*, 2½—4 lines.
** Middle of abdomen brown-red; base of hind tibiæ white (absent in a var.). - - - - - 56. *basizonus*, 3½ lines.

Section 4.—Scutellum black; abdomen red or red and black.

A. Antennæ black (females); var. of *fumator* red at the base.
a. Metathoracic areæ complete and distinct.
* Abdomen distinctly narrower than the thorax, lanceolate.
14. *nitidus*, 2⅓—3 lines.
** Abdomen as broad as the thorax, oval.
† 2nd and 3rd segments of abdomen more or less red.

‡ Aculeus about one-fourth or one-third of abdomen.
8. *fumator*, 1¾—2 lines.

‡‡ Aculeus half of abdomen. - - 13. *pullator*, 1⅓—1½ line.

‡‡‡ Aculeus rather shorter than the abdomen. *speculator*, 2¼ lines.

†† 2nd to 5th segments red; aculeus half of abdomen.
17. *vagans*, 2 lines.

b. Metathoracic areæ incomplete.
2nd to 7th abdominal segments red. 48. *scoticus*, 3—3¼ lines.

B. Antennæ black, red at the base (females).

a. Metathoracic areæ complete.

* 1st abdominal segment distinctly aciculate.

† 2nd segment polished, at the most with very scattered punctures or aciculations.

‡ Aculeus about half of abdomen; legs red, or almost entirely so.

§ 2nd abdominal segment red. - *nanus*, 1¼ to nearly 1½ line.

§§ 2nd and 3rd segments red, 4th more or less so.
7. *rufulus*, about 2½ lines.

‡‡ Aculeus very short; middle of abdomen red.
6. *variabilis*, 2½ lines.

†† 2nd segment finely aciculate; aculeus about one-fourth of abdomen.

× Coxæ black. - - - - - 33. *semipolitus*, 3 lines.

×× Coxæ red. - - - - - - 12. *æreus*, 2 lines.

** 1st abdominal segment polished, or with very scattered punctures or aciculations.

† Middle and hind tibiæ not spined along the outside.

‡ 2nd and 3rd abdominal segments, and greater part of legs, red.
18. *ovatus*, 2½ lines.

‡‡ Abdomen red, 1st segment more or less black.

§ Aculeus at least one-third of abdomen.

× Hind femora red. - - - 19. *bitinctus*, 2—2½ lines.

×× Hind femora more or less black.

o Legs red, greater part of hind femora black.
24. *plagiator*, 1¾—3 lines.

oo Tibiæ and apex of front femora red. 25. *erythrogaster*, 2 lines.

§§ Aculeus very short; legs red. - - 20. *exiguus*, 1⅘ line.

†† Middle and hind tibiæ with spines along the outside.
35. *vagabundus*, 3—4 lines.

b. Metathoracic areæ not complete.
Segments 1st to 4th, front femora and tibiæ, red.
42. *rufinus*, 3 lines.

C. Antennæ red-ringed (females).
Metathoracic areæ complete and distinct.

* 1st segment distinctly aciculate.
Middle of abdomen and legs almost entirely red.
7. *rufulus*, 2½ lines.

** 1st and 2nd segments polished.
Abdomen red, petiole black; tibiæ and apex of front femora red.
25. *erythrogaster* var., 2 lines.

D. Antennæ white-ringed (females).

a. Metathoracic areæ complete and distinct.

* Abdomen and legs red; petiole and coxæ black; hind and middle tibiæ spined outside. - - 35. vagabundus, 2⅓—3½ lines.

** Segments 2nd and 3rd and greater part of legs red; aculeus half of abdomen; apex of abdomen white - - *fulgens*, 3 lines.
b. Metathoracic areæ not complete and distinct.
* Metathorax so rough that the areæ are not distinct.
† Abdomen red; tibiæ partly white. 38. *parviventris*, 3—4 lines.
†† Segments 2nd to 3rd, femora and tibiæ, red; apex of hinder black. 39. *quadrispinus*, 3—4 lines.
** Metathorax not so roughened, more or less distinctly rugose.
‡ 1st and 2nd abdominal segments polished.
§ Abdomen red, petiole black.
× Inner orbits above the antennæ red. - 46. *errator*, 4 lines.
× × Inner orbits not red.
o Hind tibiæ red, apex black; legs rather stout. 47. *abdominator*, 2—3½ lines.
oo Hind tibiæ black, extreme base lighter; legs less short and thick. 49. *obscuripes*, 3¼ lines.
§§ Apex of abdomen, and more or less of the 1st segment, black.
+ Coxæ black. - - - - - - 45. *curvus*, 3—4⅕ lines.
+ + Coxæ red. - - - - - - - *probus*, 2½—3 lines.
‡‡ 1st abdominal segment aciculate, 2nd finely reticulate.
Abdomen red, apex black, anus white, legs red; aculeus as long as the abdomen. - - - - 63. *lacteator*, 3—3½ lines.
E. Antennæ tricoloured (females).
a. Metathoracic areæ complete and distinct.
* 1st segment distinctly aciculate.
Segments 2nd to 3rd and legs almost entirely red; aculeus very short. - - - - - - 5. *dumetorum*, 2⅓—2⅔ lines.
** 1st and 2nd segments polished, at the most with scattered punctures and aciculations.
† Abdomen red, petiole black.
‡ Middle and hind tibiæ with spines on the outside. 32. *profligator*, 2⅓—3½ lines
‡‡ Middle and hind tibiæ without spines. 26. *brevis*, 2—2½ lines.
†† Apex of abdomen black.
§ Legs entirely red. - - - - - 27. *gravipes*, 2⅓ lines.
§§ Apex of hind femora and tibiæ black. 28. *improbus*, 2—3 lines.
b. Metathoracic areæ not complete and distinct.
* 1st segment not regularly punctured, with scattered punctures or indistinct aciculations, generally polished in front, and without any perceptible sculpture; 2nd segment polished, with now and then very fine scattered punctures.
† Metathorax with two transverse lines; supero-medial area not defined at sides. - - 28. *improbus*, var., 2—3 lines.
†† Metathorax with one or no transverse lines, the lateral areæ not subdivided.
‡ Metathorax polished.
Segments 1st to 3rd and greater part of legs red; aculeus half of abdomen. - - - - - 43. *graminicola*, 2½ lines.
‡‡ Metathorax more or less distinctly rugose.
§ Hind tibiæ red, apex black. - - 54. *Spinolæ*, 3 lines.
§§ Hind tibiæ white at the base, apex black. 56. *basizonus*, 2—3½ lines.

** 1st and 2nd segments densely and evenly punctured.
66. *erythrinus*, $2\frac{3}{8}$ lines.
F. Metathoracic areæ complete and distinct (males).
a. Supero-medial area transverse.
* Supero-medial area hexagonal, not rounded in front or behind.
† Tibiæ white-ringed. - - - 38. *parviventris*, 4 lines.
†† Tibiæ not white-ringed; abdomen red, petiole black.
‡ Middle and hind tibiæ spined outside. 35. *vagabundus*, 4 lines.
‡‡ Tibiæ not spined outside.
§ Legs stout, femora black. - - - 49. *obscuripes*, 4 lines.
§§ Legs slender, femora red. - - - 47. *abdominator*, 4 lines.
** Supero-medial area transverse, rounded at least in front.
× 1st and 2nd segments aciculate.
Greater part of abdomen and legs red. - 2. *rugulosus*, $2\frac{1}{2}$ lines.
× × 2nd segment polished, not aciculate.
o Part of face and front coxæ white. - 15. *bifrons*, $2\frac{1}{4}$—$2\frac{3}{4}$ lines.
oo Face and front coxæ black. - - - 17. *vagans*, 2 lines.
× × × 1st and 2nd segments polished. 34. *subtilicornis*, 2—$2\frac{1}{4}$ lines.
b. Supero-medial area as broad as long, but never quadrate.
* Supero-medial area would be hexagonal, but for the bottom line projecting inwards in the form of an angle or bow.
† Mouth and inner orbits white. - 11, *jejunator*, $2\frac{1}{2}$—$3\frac{1}{4}$ lines.
†† Face black.
‡ The 3rd abdominal segment, only, red; legs dark.
10. *troglodytes*, 2 lines.
‡‡ 2nd to 3rd or 2nd to 4th abdominal segments red; legs vary.
§ 2nd segment very indistinctly aciculate. 6. *variabilis*, $2\frac{1}{2}$—3 lines.
§§ 2nd segment not aciculate. - - 8. *fumator*, $1\frac{3}{4}$—3 lines.
** Supero-medial area hexagonal, with more or less blunt angles.
× Inner orbits white. - - - 56. *basizonus*, 2—$3\frac{1}{2}$ lines.
× × Inner orbits black.
o All the coxæ of the same colour.
-+ Coxæ and legs red, or greater part red.
+-+ Coxæ not darker than the legs; base of antennæ generally red.
5. *dumetorum*, $2\frac{1}{3}$—$2\frac{2}{3}$ lines.
+-++-+ Coxæ darker than the legs. - - 8. *fumator*, $1\frac{3}{4}$—3 lines.
-+-+ Coxæ black.
∽ All the femora red or black. - - - - 8. *fumator* var.
∽∽ All the femora more or less browned; the hind ones, especially, very slender; 2nd to 6th segments red. 9. *tenuipes*, 3 lines.
oo Hind coxæ darker than the front ones.
Front and middle coxæ more or less red and white; hind ones black, or partly so. - - - - - 8. *fumator* var.
*** Supero-medial area pentagonal; 1st segment aciculate.
Middle of abdomen and legs partly red. 23. *ambiguus*, 3—$3\frac{1}{2}$ lines.
c. Supero-medial area distinctly longer than broad, in shape pentagonal or hexagonal.
† Inner orbits white.
* Metathorax with lateral spines; 1st segment with prominent spiracles. - - - - 64. *sperator*, $2\frac{1}{2}$—$3\frac{1}{2}$lines.
** Metathorax without lateral spines; spiracles of 1st segment scarcely perceptible. - - 63. lacteator, $2\frac{1}{2}$—4 lines.
†† *Inner orbits* not white.

‡ Base of antennæ and back of middle abdominal segments red.
12. *æreus*, 2 lines.

‡‡ Segments 2nd to 4th or 5th red; base of antennæ black.
65. *procerus*, 2½—5 lines.

G. Metathoracic areæ not complete or distinct (males).

* Metathorax very rough, so that the areæ are not distinct.

† 1st segment broad; apex of hind femora black; face and front coxæ white-marked. - - 39. *quadrispinus*, 3—4 lines.

†† 1st segment narrow; hind femora, face and front coxæ, black.
40. *senilis*, 2¾—3¼ lines.

** Metathorax not very rough.

a. Metathorax with two cross lines; the supero-medial area not closed at the sides.

Segments 2nd to 4th red,* or red with dark bands;** femora and tibiæ red, apex of hinder black.

* 2nd abdominal segment smooth. - 14. *nitidus*, 2⅔—3½ lines.

** 2nd segment distinctly punctate. - - *Marshalli*, 3 lines.

b. Supero-medial area not closed above, in form 4- or 6-angled; if closed above then somewhat quadrate, the upper lateral areæ often wanting.

* Legs marked with white.

† Front coxæ and trochanters white.

‡ Hinder coxæ black. - - - 68. *galactinus*, 2½—3 lines.

‡‡ Hinder coxæ red. - - - - 28. *improbus*, 2—3 lines.

†† Coxæ and trochanters black.

§ Internal orbits, a line below the wings and ring of tarsi, white.
69. *subguttatus*, nearly 4 lines.

§§ Base of tibiæ and orbits white. - 56. *basizonus*, almost 4 lines.

** Legs not marked with white; middle of abdomen red.

× Clypeus and labrum whitish. - - 55. *labralis*, 3—4 lines.

× × Face not white-marked.

o Metathoracic spiracles almost linear.
50. *erythrostictus*, 4—4⅔ lines.

oo Metathoracic spiracles round, or nearly so; supero-medial area subquadrate.

+ Greater part of hind femora black. - 52. *assimilis*, 3—5½ lines.

++ Hind femora red, apex black. - - - 57. *sericans*, 3⅔ lines.

c. Supero-medial area not closed below, which forms a long area from base to apex of the metathorax.

* Slanting part of the metathorax perpendicular. 70. *subtilis*, 2½ lines.

** Slanting part of the metathorax forms a continuation of the upper part by a gradual slope.

Legs vary much in colour. - 71. *teneriventris*, 2¼—2¾ lines.

SECTION 5.—Thorax more or less red.

Abdomen red, apex black, anus white-marked, antennæ white-ringed (females).

* Hind femora black.

† Head almost entirely red. - 30. *sanguinator*, 2½—3 lines.

†† Head almost entirely black.

‡ Metathoracic areæ complete and distinct. 29. *flagitator*, 2¼ lines.

‡‡ Metathoracic areæ incomplete. - - 58. *tyrannus*, 3 lines.

** Greater part of hind femora red. - 31. Hopei, 2⅓—2⅔ lines.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. VIII.—WATER COLLECTING (*continued*)—MOSS, HAYSTACKS, &c.

The *Philhydrida*, as a general rule, are common, and many of the scarcer species are very probably often passed over by collectors, in consequence of the resemblance they bear to commoner species. Many of the minuter groups, such as *Hydrænæ* and *Octhebii*, are best taken by scraping the mossy sides of pools and swamps with a net, having a metal rim, as described in last month's 'Entomologist.' The *Berosi* are not common, but may occasionally be taken in abundance; I found *Berosus affinis* very plentifully on one occasion in brackish pits in Lymington Salterns. The *Helophori* are a very unsatisfactory group, and want some one to work them out thoroughly; several species have lately been added to the British list, and very probably others remain to be discovered. *Hydrophilus* and *Hydrous* have already been mentioned as occurring in the London district; the former, in spite of its formidable appearance, is a vegetable feeder, and may be kept with safety in an aquarium with fish; its larva, however, is carnivorous, and very voracious. *Cyclonotum* is very common in some localities. *Chœtarthria* appears to be rather local, but may be obtained in damp moss in some abundance where it occurs. *Limnebius picinus* is very local, but abundant where it is found; *L. nitidus* seems to be rare. The other two species of the genus are common.

The *Elmides* and *Parnides*, although not usually classed with the water-beetles, cannot be mentioned in any other connection. The species of *Elmis* are found adhering to the bottom of stones under water, and require a practised eye to find them, as, at first sight, they look like so many little shapeless masses of dirt; *Elmis æneus* is the commonest species, and *E. Volkmari* the largest and most conspicuous. The rare *Macronychus* (first discovered by Mr. Harris in the Dove, near Burton) is always found attached to logs, and never to stones. In the same place I have found *Potaminus substriatus;* this beetle seems to be found almost always under clods of earth, near the bank, that have been dislodged and fallen into the water.

The very rare *Eubria palustris* may almost be called a water-beetle. The first British specimen was taken by the Rev. H.

Matthews, by sweeping in peat-pits, near Weston, Oxfordshire: although he tried the same place for some years, neither he nor the Rev. A. Matthews could discover another specimen, until one day, while searching the edges of a small ditch, about a foot broad and two inches deep, for *Leistus rufescens* (then considered a rare beetle), the latter collector happened to pull up some small sticks from the bottom, and on these he found *Eubria* in abundance. It seems never to be found except about the last week in July. *Hydrocyphon deflexicollis*, as its name (the water-cyphon) implies, is always found in swampy ground, if not actually in the water.

The water Hemiptera are well worth working at the same time with the Coleoptera. Many species, such as *Nepa* and *Notonecta*, the water-scorpion and water-boatman, are familiar to the most casual observer of pond-life. *Aphelocheirus* and *Mesomelia furcata* are very rare, and have never been taken in abundance, except by Dr. Power; the former appears only to be found in running streams. *Ranatra* is rather rare, but is found not uncommonly near London and Deal. The genus *Corixa* is very interesting, but very hard to work out at first: species are to be found in almost every pool and stream, and new ones often fall to the lot of any person who really works the genus; the points of distinction between the species, although in many cases small, seem to be constant, but it is a question whether we have not too many species, and whether some of them will not have to be merged into other species, as has already been done in one or two cases. The minuter water Hemiptera, *Plea, Cymatia* and *Sigara*, are usually found with the *Corixæ*, of which the species of the two latter genera are abridged likenesses.

The productiveness of moss on the edges of ponds has already been spoken of, but the half-submerged moss in and under waterfalls requires mention. It is under this that *Dianous cærulescens, Stenus Guynemeri, Quedius auricomus*, and the rare *Euryporus picipes*, are to be found. I believe that the very scarce *Homalota cærulea* has been found in Derbyshire in the same way, but I have never taken it. The *Elmides* seem to prefer stones in broken water or waterfalls. *E. subviolaceus*, for instance, occurs in profusion under a mossy waterfall, on the shore near Steephill, Ventnor.

To leave water-collecting altogether, we may say that moss in any locality is productive of good species. At all seasons of the year *Scydmænidæ*, small Staphylinidæ, especially *Tachypori* and

Homalotæ, *Trichopterygidæ*, and many others, may be obtained by shaking moss over paper; but it is in winter that moss collecting is most productive; the shelter that it affords is most attractive to numbers of species, and *Halticidæ*, *Curculionidæ*, *Coccinellidæ*, *Carabidæ*, and in fact species of almost any genera, may be found, although those above-mentioned are always the most abundant. Moss at the roots of trees is perhaps the best to gather, but *Sphagnum* in swampy ground will often produce many good species, and in moss off old walls I have found many scarce insects, such as *Cryptophagus pubescens*, *Scydmænus elongatulus*, *Homalota atricolor*, and others.

The following species, which have been recorded as taken in or under moss, will show the value of such collecting:—*Carabus intricatus* (many specimens in moss at roots of trees in Devonshire), *Lebia crux-minor*, *Platyderus ruficollis*, *Stenolophus flavicollis*, *S. dorsalis*, *Cœnopsis fissirostris*, *Trichonyx Maerkeli*, *Pselaphus dresdensis*, *Cephennium intermedium*, *Tachyporus formosus* (in abundance near Chiselhurst, by Rev. A. Matthews), *Tachyporus obtusus* var. *nitidicollis* (in abundance in Ireland, by Mr. J. J. Walker), *Gymnusa variegata*, *Lathrobium angustatum*, *Trichopteryx variolosa*, *T. brevipennis*, *T. dispar*, and many others of the best of the *Trichopterygidæ*.

In late autumn and winter the bottom layers of the heaps of dry leaves, that accumulate everywhere at the bottoms of hedges and in woods, are well worth working. My friend, the late Mr. Garneys, of Repton, was always most enthusiastic about this method of collecting, and certainly owed many of his best captures to it. I remember his telling me that Mrs. Garneys obtained one of the first British specimens of *Trichonyx Maerkeli* in this way. Many good species of the *Curculionidæ*, especially *Apions*, may be found at the bottoms of hedges by examining the dead leaves. It is not of much use, however, to search for *Trichopterygidæ* in dry leaves; they are exceedingly abundant, but will be found in almost all cases to consist of the very commonest species.

The large coarse tufts of grass that are to be found in almost every field are very productive if cut round with a sharp knife, lifted gently, and then inverted and shaken over paper. This is a very good method of collecting in winter, as it is almost certain to produce something, if all else has failed. Almost any beetle may be found in this way, as the tufts are favourite hybernating places; *Staphylinidæ*, however, especially *Steni*, are the commonest.

The damp bottom layers of haystacks afford shelter to numerous species, especially during the winter; my experience, however, of haystacks has not been a very good one, as I have found that *Atomaria ruficornis*, *Lathridius ruficollis*, and a few common *Homalotæ*, *Oligotæ*, and *Steni*, have usually made up the bulk of my captures. There is no doubt, however, that in some localities there is nothing better worth working than a haystack. A little while ago I received two *Steni* from Mr. Bedford Pim, taken under a haystack near London, which turned out to be *S. asphaltinus;* and *Pseudopsis sulcatus*, *Heterothops quadripunctulus*, *Atomaria impressa*, several rare species of *Cryptophagus*, *Bolitobius inclinans*, and many others, have been recorded from such localities.

A collector, who wishes to adopt any of the four methods of collecting above mentioned, will do well to provide himself with a good-sized bag and a small sieve, about ten inches or a foot in diameter. The moss, perhaps, as it packs into a small space and is not easily shaken through, may be taken away bodily; but still in many cases the sieve is very useful, for dry moss especially; in dealing, however, with tufts of grass, dry leaves, or haystacks, the sieve is indispensable; the insects from a large mass may soon be shaken out through the sieve into the bag, and the whole of the shakings may then be conveniently examined at home at leisure. A small ordinary wooden sieve will of course suit the purpose, but it is far better to have the sides made of strong calico than of wood, and very much deeper; we shall then have a sort of bag with a net-work at the bottom, which will contain far more than an ordinary sieve, and can be shaken much more violently without any fear of losing the contents; it has, too, the great advantage of being easily carried, as it can be folded up flat.

As a conclusion for this article, we may perhaps consider birds'-nests, which should not be passed over when it is possible to examine them. *Cholevæ* may usually be found by shaking the nests over paper, and sometimes good species of *Histeridæ*. Pigeon's-nests have produced *Aleochara villosa*, *Homalium Allardi*, *H. florale*, and, I believe, H. punctipenne, *Ptinus fur*, *Niptus crenatus*, various *Cryptophagi*, &c. Sand martins' nests have been found to contain *Haploglossæ*. The very rare *Philonthus fuscus*, and the variety *coruscus* of *P. ebeninus*, have been taken from nests, and probably many other good species might be found if we knew in what kind of nests they might be looked for.

I have omitted one point, and that is that old thatch on and about houses should not be neglected. I have had no experience myself of this kind of working, but I believe that Dr. Power and other collectors have been very successful when they have tried it.

The School House, Lincoln, September 12, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

One day's Collecting in the Abbots' Wood district.—On Monday, May 29th, we had the pleasure of a day's ramble through the woods near Polegate, including the famous Abbots' Wood, on which occasion, by dint of hard work, we had the satisfaction to bag a decent number of lepidopterous larvæ, various imagos of the same order, and of the order Coleoptera. Taking Mr. South's hint, and thinking the "record of results" of one day's outing might possibly be worthy a corner in the 'Entomologist,' we have been induced to pen this. Commencing our operations, with a Bignell beating-tray, in the White Field, a couple of hours' work put us in possession of larvæ of the following species, viz.: — *Thecla quercus*, *Nola cucullatella*, *Lithosia complana*, *Liparis auriflua*,* *L. monacha*,* *Orgyia fascelina*, *Demas coryli*, *Pœcilocampa populi* (abundant), *Bombyx neustria*,* *Phigalia pilosaria*, *Nyssia hispidaria*, *Amphydasis prodromaria*, *Cleora lichenaria*, *Hybernia rupicapraria*,* *H. aurantiaria*,* *H. defoliaria*,* *Eupithecia virgaureata*, *Cymatophora diluta*, *Tæniocampa miniosa*, *T. gothica*, *T. munda*, *Scopelosoma satellitia*, *Cosmia trapezina*,* *Amphipyra pyramidea*, *Phycis roborella**; those marked with an asterisk were very common, as a matter of course. After luncheon, pushing on through the adjoining plantation, we struck the roadway to Hailsham, adding, meanwhile, to the list of larvæ, *Cymatophora ridens*, then very small. The imagines had now our chief attention, and up to about 5 p.m., when we had the pleasure of sighting "The Old Oak," we had captured thirty-eight species, the list being:—*Pieris rapæ*, *Anthocharis cardamines*, *Argynnis Euphrosyne*, *A. Selene*, *Vanessa cardui*, *Chortobius Pamphilus*, *Thecla rubi*, *Syricthus Alveolus*, *Thanaos Tages*, *Hesperia Sylvanus*, *Hepialus hectus*, *H. lupulinus*, *Lithosia rubricollis*, *Chelonia plantaginis*, *C. villica*, *Orgyia pudibunda*, *Venilia maculata*, *Odontopera bidentata*, *Tephrosia consonaria*, *T. extersaria*, *Iodis lactearia*, *Asthena candidata*, *Timandra amataria*, *Cabera pusaria*, *C. exanthemaria*, *Lomaspilis marginata*, *Emmelesia affinitata*, *Melanippe hastata*, *M. montanata*, *Cidaria corylata*, *Anaitis plagiata*, *Herminia barbalis*, *Scoparia ambigualis*, *S. mercurialis*, *Cryptoblabes bistrigella*, *Crambus pratellus*, *Penthina prunaria*, *Adela Degeerella*. After doing justice to Mr. Lambert's "home-cured," we again turned into the woods, our principal captures on the way back being *Ennychia octomaculalis* and some half dozen *Agrotera nemoralis* in good condition. We are indebted to Mr. G. Lewcock for naming the following species of Coleoptera taken on this occasion:—*Bradycellus verbasci*, *Gastrophysa polygoni*, *Malachias bipustulatus*, *Telephorus lividus*, *T. limbatus*, *Balaninus glandium*, *B. tesselatus*, *Polydrosus pterogonalis*, *P. cervinus*, *Cetonia aurata*, *Rhynchites cupreus*, *Dasytes plumbeo-niger*, *Anaspis frontalis*, *Lagria hirta*, *Athous hæmorrhoidalis*, *Malthodes sanguinolentus*, *Phyllobius pomonæ*, *Omosita discoidea*, with about half a score others, which are as yet unnamed. In addition to the above we boxed various species of Neuroptera, Homoptera, and Hemiptera; and ultimately arrived at Eastbourne, after our day's collecting, at about 11 p.m.—OLIVER C. GOLDTHWAIT, Church End, Walthamstow; J. A. CLARK, The Broadway, London Fields.

CHŒROCAMPA ELPENOR LARVA FEEDING ON ENCHANTER'S NIGHTSHADE.—I took lately at Farnham, Co. Cavan, a well-grown larva of *Chærocampa elpenor* feeding upon the leaves of *Circæa lutetiana*, which it continues to eat ravenously in confinement. This is, I think, a new food-plant for this handsome Sphinx—the commonest of its tribe in Ireland.—WM. FRAS. DE V. KANE, Sloperton Lodge, Kingstown, August 22, 1882.

TRICHIURA CRATÆGI FEEDING ON POPLAR.—On August 17t I bred a small male specimen of *Trichiura cratægi* from a larv which I found in May last feeding on poplar. I have known it t *feed on oak*, birch, sallow, and blackthorn, but I have never foun *it on poplar* before.—A. THURNALL; Stratford, August 19, 1882.

Acronycta alni near Bristol.—While collecting in Leigh Woods to-day with Capt. Shelley, I was much pleased at finding a full-fed larva of *Acronycta alni* on sweet chestnut. This species has turned up in this neighbourhead singly for the last three years.—W. K. Mann; Clifton, Bristol, August 17, 1882.

Plusia bractea in Co. Clare.—At the end of July last, during a visit to Lisdoonvarna, Co. Clare, a specimen of *Plusia bractea* was brought to me, caught in the hotel where I was staying. This insect seems uncommon in Ireland. I think only three counties have yet been recorded where it has occurred, *viz.*, Wicklow, Kilkenny, and Sligo.—[Rev.] W. W. Flemyng; Portland, Co. Waterford, September 7, 1882.

Successful breeding of Nola centonalis.—I have again succeeded in rearing a fine brood of this delicate and variable species, from the eggs obtained at Deal, in July. They fed up well and rapidly, exclusively on clover flowers; they commenced hatching first week in August, and were full-fed and spinning up by the first week in September.—W. H. Tugwell; Greenwich.

Emmelesia blandiata in Surrey.—Whilst entomologising in Sussex on the South Downs, during July, I captured a specimen of *Emmelesia blandiata* in perfect condition, and evidently only just out. Some interest may attach to this fact, since my friend Mr. J. B. Hodgkinson, of Preston, tells me that this is the first known occurrence of the insect in question in the South.—[Rev.] H. T. Hutchinson; Whalley, Blackburn, Lancashire, August, 1882.

[Is our correspondent quite sure of his species?—Ed.]

Rarity of Lepidoptera.—I have been rather surprised at the unanimous accounts given by your correspondents, in the 'Entomologist' for August and September, of the great scarcity of Lepidoptera this season. Mr. Bradbury (Entom. xv. 192) goes so far as to report a "total failure"; and Mr. Prest, an old hand, calls it the "worst he ever remembers." I have been for several entomological excursions in different directions, and, although the greater number of both days and nights throughout June and July were most unfavourable for collecting, I found insects quite as abundant as ever before when the weather was favourable. Taking one species for instance, *Lithosia pygmæola*, which has been particularly mentioned as being "very scarce" this year Entom. xv. 191), I found them in the very greatest profusion on the evening of July 15th. Mrs. Bird and myself boxing them a fast as it was possible. Other species, local and otherwise, I hav also seen or captured in equal plenty on good nights; and, so fa as my experience goes, I attribute the "scarcity," "failure," an what not, to the unfortunate proportion of fine weather.—G. W Bird; Hurley Lodge, Honor Oak, S.E., August 14, 1882.

The bad season for Lepidoptera.—It will perhaps be of interest to some of your readers to know my experience of the present season with regard to Lepidoptera. I agree with your correspondents that the present is the worst season I have ever known, so far as number of species is concerned; but along with this fact is the curious and interesting one that some common species have been unusually abundant. Butterflies have been very scarce; I do not think that I have seen more than six species in this district during the whole season. The spring broods of *Pieris rapæ* and *P. napi* were plentiful, but not a single *P. brassicæ* was to be seen; *Satyrus Janira* has been by no means abundant; and these, with the addition of one specimen each of *Anthocharis cardamines*, *Vanessa Io*, and *V. urticæ*, about complete the list. Many species of moths, usually very abundant, have this year been scarce; but, on the other hand, the following have been swarming:—*Tortrix viridana*, many oaks were nearly stripped by this species; *Coccyx argyrana* in scores on the trunks of oaks; *Sciaphila subjectana* in thousands everywhere; *Argyresthia retinella* swarming in hedges. Besides these Micros some Macros have been very abundant:—*Chelonia caja*, sometimes as many as a dozen came to light in one evening; *Mamestra brassicæ* was unusually abundant; *Charæas graminis* has been more frequent than usual. I leave it to other entomologists to draw deductions from these facts.—H. H. Corbett; Ravenoak, Cheadle Hulme, Stockport, August 17, 1882.

Captures of Lepidoptera.—There appear to be very opposite reports from collectors as to their captures this season. I see from the August number of the 'Entomologist' that one correspondent has given up collecting as a bad job, another has rarely had such a bad season, whereas the next has taken rather more insects than usual. For my part the few Lepidoptera I have come across have appeared in large numbers. I spent the last two weeks of May at Shanklin, in the Isle of Wight, and never went out without seeing *Satyrus Megæra* flying in every lane and field; *Cœnonympha Pamphilus* and *Lycæna Icarius* were also quite common. A large bed of nettles close to the sea was quite black with thousands of *Vanessa urticæ* larvæ; I brought home a great many of these, hoping to get varieties, but they all appeared, in due course, of the normal type. I also took one specimen of *Venilia maculata*, a few of *Melanippe montanata*, and three good specimens of *Nola cristulalis*. *Pieris rapæ*, *P. napi*, *Acidalia imitaria*, *Hepialus lupulinus*, and larvæ of *Bombyx quercus*, *B. neustria*, *Odonestris potatoria*, also fell to my share in the Isle of Wight. In and near London I have found many larvæ of *Chelonia caja*, and every evening we have half a dozen or more *Boarmia rhomboidaria* moths flying round the drawing-room ceiling or into the gas, accompanied not unfrequently with specimens of *Ourapteryx sambucata*, several species of *Eupitheciæ*, and, on August 8th, *Cosmia trapezina*, though there are no oaks that I know of in the vicinity. Along the railway lines and fields at Willesden and Acton, *Camptogramma bilineata* and *Eubolia mensuraria* can be taken in large numbers; at one part *C. bilineata* was quite a nuisance, three or four rising out of the long grass at every step. I heard that *Hesperia sylvanus* had also been very common at East Acton along the railway bank. — CHAS. E. M. INCE; 29, St. Stephen's Avenue, Shepherd's Bush, July 11, 1882.

NOTES FROM THE ISLE OF MAN.—Seeing in the 'Entomologist' many complaints of the scarcity of insects during this season, I wish to offer a few observations on collecting in the Isle of Man. I have been accustomed to pay annual visits to the island, twice visiting it this season, but never saw insects in general more scarce. I went on June 2nd, intending to take the larvæ of *Sesia philanthiformis* and *Polia nigrocincta;* not a single specimen was to be seen of the former, and the latter was exceedingly rare, as I only took three, from which I reared one specimen, and of this the hind wings were crippled. On searching for *Polia nigrocincta* larva on the flowers of the sea-pink, *Statice armeria*, I was surprised to find, feeding on these flowers, *Triphæna orbona*, as well as *Epunda nigra*. I had taken *T. orbona* in the island before, feeding on foxglove. *Dianthœcia capsophila* and *D. cæsia* were on the wing, but not so numerous as I have seen them; and *Eupithecia venosata*, which I have also seen common, was very rare. I again went to the island on June 30th, and found *D. capsophila* larvæ feeding in the sea-pods of *Silen inflata* with *D. cæsia*, but, being rather late, it was scarce. *Setin irrorella*, which I have often taken, I did not see either journe this season. Other common species, which I have seen ver plentiful, were as scarce; and I consider, on the whole, it ha been a very bad season for collecting in the island.—JOH THORPE; Spring Gardens, Middleton, near Manchester, September 12, 1882.

CAPTURE OF HARPALUS OBLONGIUSCULUS IN DORSETSHIRE.—It may interest your readers to know that I captured four fine specimens of *Harpalus oblongiusculus* in August last, beneath stones on the coast, near Portland.—[Rev.] O. P. CAMBRIDGE; Warmwell, Dorset, September, 19, 1882.

POLYSTICHUS VITTATUS, *Brullé*.—On July 15th I had the good fortune to find a specimen of this local species in a garden at Maidenhead. It was running swiftly in a dish of raspberries, and had doubtless come to obtain what moisture the fruit afforded. My friend, Mr. F. D. Donaldson, captured another specimen at Sydenham a few days ago, feeding upon treacle placed on a brick wall to attract Lepidoptera. The capture made at the latter locality is most interesting, although only a single example was taken, as it has never before been recorded from any locality so near London.—A. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, N.W., August 1, 1882.

MECINUS COLLARIS, *Germ.*—During the last week in August, while I was searching for insects along the coast, I observed some of the flowering stems of *Plantago maritima* very much swollen and discoloured; I brought home a handful, from which I have bred this little beetle. I was rather surprised to see the great variation in colour; the lightest were a dirty yellow, and all shades occurred up to black. Dr. Power, to whom I sent half a dozen (not two alike), had previously noticed this, and also remarked that Mr. Moncreaff had bred it in abundance about twelve years ago from the same plant, collected near Portsmouth (Entom. v. 451).—G. C. BIGNELL; Stonehouse, Plymouth, September 14, 1882.

HYMENOPTERA IN NORFOLK.—Aculeate Hymenoptera are fast becoming "extinct animals" in this county; after the very mild winter and warm early spring, I naturally expected to see the solitary bees swarming, but alas! I was doomed to disappointment.

I have walked hour after hour without seeing half a dozen specimens of *Halictus* or *Andrena;* I took a few males of *Andrena Smithella* on Easter Monday. I have not seen a single female specimen of *A. nigro-ænea*, *A. bimaculata*, or *A. combinata;* these are generally fairly abundant; the first one is very common. I have not seen more than half a dozen specimens of *Nomada*, and most of those were *N. ruficornis;* only one male of the genus *Megachile* or leaf-cutters, two or three *Osmia fulviventris*, and one solitary *Anthidium manicatum* are all I have met with. It is two years since I have seen a living *Cœlioxys*, the parasite of the leaf-cutters. The only exception to this dismal catalogue is the true wasps; in the spring the females were more abundant than usual, but up to the present time the neuters have been far from plentiful. Sawflies have been even worse than the Aculeates this year; I cannot remember that I have beaten a single fly into my umbrella this season, and I am quite sure that I have not yet seen a single specimen of *Tenthredopsis;* and many that are usually common have not put in an appearance. Ichneumons are almost as scarce; I have many a time beaten till tired for less than a dozen insects. I have been fortunate enough to breed both sexes of *Pezomachus vagans* from a spider's nest, and Mr. Bignell has bred the two sexes of another *Pezomachus.* I believe many species of *Hemiteles* and *Pezomachus* may still be reared from spiders' nests; I have bred three species of *Pezomachus* and three of *Hemiteles* from five different kinds of nests, one of which was even guarded by the female spider in a rolled-up nettle-leaf; I think many of the bred *Pezomachi* are lost in consequence of their small size allowing them to slip through the material that is used for ventilating the breeding-cases. I am afraid the above miserable experience is very general; all my correspondents make the same complaints. In the July number of the 'Entomologist' was a very interesting account of a parasite of *Dicranura vinula*, which the observer thought was *Paniscus testaceus;* I have had a great many of these parasites through my hands, and all were *P. cephalotes*, a very closely allied species, which has the head swollen behind the eyes; whilst in *P. testaceus* it slopes towards the neck, when seen from above; I think these parasites most probably are *P. cephalotes*, not *P. testaceus.*—JOHN B. BRIDGMAN; Norwich, July, 1882.

[The species bred by Mr. E. W. Andrews is Holmgren's *P. cephalotes.*—*E. A. F.*]

The Thrips of the Fuchsia.—For some time past th leaves of our fuchsias have been attacked by two sorts parasites: one of these belongs to the division of the Orthopter Pseudo-neuropters; to the genus *Heliothrips;* to the specie *Heliothrips adonidum*, Haliday, or *H. hemorroidalis*, Bouch This thrips lives on the lower sides of the leaves, of which devours the outer surface; it is very destructive, and very difficu to destroy. Do your readers know anything about this insect ? Have there been any publications on this subject, and in what papers ?—E. Lefevre; 35, Place des Marchès, Rheims, France, August 9, 1882.

[We are not aware of anything authentic that has been written on this subject. Perhaps some of our readers can give information. Mr. Pergande's note (Entom. xv. 94) may interest our correspondent.—Ed.]

Napthaline.—The note on the use of napthaline for the protection of insect collections, in your July number (Entom. xv. 105), attracted my attention. I beg leave to state that I have used napthaline for over a year in my collections of eggs, mounted birds, bird skins, nests, and a general collection of insects. I have always had uniform success. I procure it in lumps, of a pale pink colour. I have never tried Mr. C. A. Blake's cones, for the reason that I am satisfied to let well enough alone. I hope to hear more on this subject.—Erastus Corning, jun.; 22, Elk Street, Albany, N.Y., U.S.A., July 30, 1882.

Naphthaline *versus* Camphor.—Naphthaline is largely, I may say generally, used by foreign collectors. The Germans seem to have a very strong prejudice against camphor, as injurious to the specimens and also to the health of those who frequently breathe the fumes from their cases. I have for some years used naphthaline in the store-boxes which contain my collections, and have now entirely abandoned the use of camphor. I find the former most efficacious as a preventative. It will not cure an infected case: for this and quarantine purposes I use a few drops of bisulphide of carbon on cotton-wool, repeated once or twice at a few weeks' interval of time. This is fatal to all insect-life, but must be used with the greatest caution, as the effects of the fumes upon human life are most injurious. To prevent mould a small piece of cotton-wool on the head of a long pin, dipped in glacial *carbolic* acid and placed in the case, is a perfect remedy.—[Rev.] W. Tasker; Châlet Ketterer, Clarens, Vaud, La Suisse.

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VOL. XV.] NOVEMBER, 1882. [No. 284.

ON THE EUROPEAN SPECIES OF THE GENUS *SMICRA* (CHALCIDIDÆ).

BY W. F. KIRBY,
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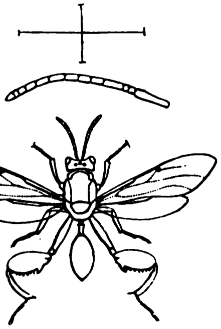

SMICRA SISPES, *Linn.*

THE genus *Smicra*, Spin. (originally misprinted *Smiera*, which is copied by many authors) includes the largest species of the subfamily *Chalcidinæ*, and may be recognised at once by its long petiole and enormous hind femora, armed with a row of teeth on the under surface. On examining the specimens in the British Museum I have found much confusion in the determination of the European species, and thought it might be useful to publish my observations without delay.

Five European species are on our lists at present, but the number is likely to be increased, as the *Chalcididæ* have hitherto been very little studied or collected. Of these, four are represented in the British Museum collection, three of which are in th British collection.

1. *Smicra myrifex.*

Sphex myrifex, Sulz.; *Chalcis sispes*, Fabr., Hübn., Panz., & Nees (but not of Linné); *Vespa dearticulata*, Fourcr.; *Smiera petiolatus*, Curt.; *Smiera nigrifex*, Walk.

Black, with yellow tegulæ and petiole, and the legs varied with black and yellow.

In the British Museum collection, from Paris, Munich, and Albania. Curtis states that it is "said to have been captured in the neighbourhood of London"; and Walker erroneously mentions two specimens from Georgia; these, however, were placed among the series of *S. sispes*, and in fact belong to a species allied to the latter, but perfectly distinct; they have nothing to do with *S. myrifex.*

2. *Smicra sispes.*

Sphex sispes, Linn.; *Chrysis sispes*, Fabr. (Syst. Ent.; but not of his later works); *Smiera sispes*, Walk., Curt.; *Chalcis clavipes*, Fabr., Panz., Nees; *Sphex fissipes*, De Vill.

Black; tegulæ ferruginous; legs varied with ferruginous; hind femora wholly ferruginous, except at the tip, which is black.

In the British Museum, from England, France, Munich, and Albania. This species stands in the 'List of British Animals: Nomenclature of Hymenoptera' as "*Smiera nigrifex*, Walk."

3. *Smicra microstigma.*

Smicra microstigma, Thoms.

Occurs in Sweden. I know nothing of this species beyond Thomson's description. It is said to be very similar to *S. sispes*, but the wings are less clouded and the thorax is less coarsely punctured.

4. *Smicra melanaris.*

Chalcis melanuris (misprint) and *melanaris*, Dalm.; *Smiera melanaris*, Thoms.; *Smiera Macleanii*, Curt.; *Chalcis biguttata*, Spin., Nees.

Black; knees, tarsi, and more or less of the tibiæ ferruginous; tegulæ, a spot towards the tip of the hind femora, and one on the outside, at the base, on which stands the outermost of two large teeth, white or yellow.

Two unnamed British specimens are in the Museum, from J. F. Stephens's collection; the species is also recorded from Sweden and Italy. After some hesitation, I have decided to regard *melanaris*, *biguttata*, and *Macleanii* as being probably synonyms of one species.

5. *Smicra* (?) *xanthostigma.*

Chalcis xanthostigma, Dalm.; *Spilochalcis xanthostigma*, Thoms.

Black, with yellow spots on the back of the thorax and on the legs.

In the British Museum, from England and Sweden. This species was confounded by Walker with the last, and is probably referred to as "*Smiera melanaris*, Walk.," in the 'Nomenclature of Hymenoptera.' It is the type of the genus *Spilochalcis*, Thoms., which is distinguished from *Smicra* by having a distinct spine at the end of the intermediate tibiæ, which is wanting in *Smicra*. The other species differ a little among themselves in the structure of the antennæ and hind femora, but hardly to a sufficient extent to make it desirable to subdivide them, especially as very little is yet known of the foreign species, which appear to be most numerous in South America.

The five European species may be tabulated as follows:—

A. Thorax black, unspotted.
  B. Petiole yellow. 1. *myrifex.*
  BB. Petiole black.
    C. Hind femora red, tipped with black. 2. *sispes.* 3. *microstigma.*
    CC. Hind femora black, spotted with yellow or whitish. 4. *melanaris.*
AA. Thorax black, with yellow spots. 5. *xanthostigma.*

Kirchner, in his 'Catalogus Hymenopterorum Europæa' (Vienna, 1867), enumerates six species of *Smicra*, as follows:—

1. *S. fulvescens*, Walk. England.
2. *S. melanaria*, Walk. England.
3. *S. nigrifex*, Walk. England.
4. *S. sispes*, F. (No locality given).
5. *S. subpunctata*, Walk. England.
6. *S. xanthostigma*, Dalm. Sweden, Vienna.

Nos. 2, 3, 4, and 6 require no further comment; *S. fulvescens* and *subpunctata* were described from the Island of St. Vincent (West Indies), which Kirchner seems to have imagined was in England.

CAUSES OF ABUNDANCE OR OTHERWISE OF LEPIDOPTERA.

By W. F. de Vismes Kane.

I hope the suggestions of Mr. South in your August number will be responded to in such a manner as will give an opportunity of investigating as fully as possible the causes which lead to the abundance or scarcity of Lepidoptera in different seasons. The present year seems to be one peculiarly suited for undertaking such an inquiry, as the scarcity everywhere complained of is undoubtedly more marked in some localities, and prevails more among certain species than others.

For the purposes of such investigation the paucity of workers in Ireland is much to be regretted, seeing that not only the climate possesses characteristics of its own, but that our summer and autumn weather of 1881 differed remarkably from that which prevailed in England, and was exceptional, Ireland having enjoyed more sunshine and less rain than usual, and the harvest here having therefore been unusually ample and well-saved, while I understand the contrary was the case in England. Observations in Ireland might, therefore, perhaps contribute in an important degree to our knowledge of the influences which favour or check the multiplication of lepidopterous insects.

I shall, for my own part, try to collect such information from any entomologist in Ireland with whom I am acquainted, and beg through the medium of your columns to appeal to any collectors in that country to oblige me with lists of their captures this year, noting the comparative scarcity or otherwise of particular species, together with as careful an analysis of the weather in each locality for the past eighteen months as is in their power to furnish.

I would also venture to suggest a few points which might be kept in mind by those who may undertake the investigation of the subject:—

1stly. Diurnal Lepidoptera, and such of the Heterocera as spin light cocoons or hybernate as larvæ above ground would, during a mild damp winter such as the last, fall an easy prey to slugs, beetles, woodlice, &c., whose rambles are stopped or checked by frost, snow, and low temperatures; whilst subterranean larvæ and pupæ would be unaffected thus. Hybernating ichneumons also might be expected to survive in proportionately larger numbers, but this would only affect the crop of Lepidoptera this autumn or next spring.

2ndly. The prevalence of extremely high winds last year and the early part of 1882 might be expected to destroy arboreal larvæ, whilst those of the marshes, or such as feed on low-growing herbage, would be little or not at all injured.

3rd. Heavy summer rainfalls would, as well as violent hail, act in precisely a similar manner, but I cannot help thinking that the cause that has operated most disastrously in the present season, at least on a portion of our entomological fauna, is the warm and sunny weather which forced on the vegetation early in spring, which was succeeded by a bitter and withering frost, keen enough, as I noticed, to blight the young leaves and sprouts of ivy, and which I believe prevailed very generally over the United Kingdom.

I need scarcely advert to the influence exercised by the weather upon the success of the entomological captures, an influence which is often inexplicable, that of wind, however, being excluded.

At the Isle of Man I learnt that scarcely any *Dianthœcia cæsia* or *D. capsophila* have been taken at Douglas Lighthouse this year, owing to the prevalence of high winds; but the capsules of the *Silene* in that neighbourhood bore witness to the ravages of an abundant supply of *Dianthœcia* larvæ.

In May and June I myself experienced the potency of atmospheric influences on the flight of nocturnal Lepidoptera, taking scarcely any during the last week of May, until, a change occurring, I filled my setting-house in a few nights with an abundant supply, whose numbers, both individually and in variety of species, surpassed my previous experience. Throughout June there was no lack of insects in such parts of Ireland as I have worked, but July and August have proved exceedingly barren, especially as to forest insects; though I can scarcely complain of such ill-success as seems to have befallen many brethren of the net in England.

In conclusion I wish to point out that if any records are available it would be very interesting to examine also what results were found to follow the abnormal weather of 1878 and 1879. The summer of 1878, following a mild damp winter, was warm and pretty sunny, while the succeeding winter of 1878–79 was like that of 1879–80, exceedingly severe and cold; whilst the summer of 1879 was characterised by little sunshine and low temperature. These characteristics seem to have been almost universal throughout the United Kingdom, with only local exceptions.

Sloperton Lodge, Kingstown, September, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. IX.—DUNG, DEAD BIRDS AND ANIMALS.

We now come to the most disagreeable part of Coleoptera collecting; and yet, unless a collector makes up his mind to reconcile himself to it, he may as well give up collecting altogether. It is well known how quickly dung, dead birds and animals, and offal of all kinds, disappear if left to themselves; although a great part of the work of removing these is performed by flies, yet the beetles take a great share in the accomplishment of the useful work. The large *Necrophori*, or burying beetles, are known to the most casual observers; the whole of the *Scarabæidæ*, which form the bulk of the Lamellicorns, the great majority of the *Staphylinidæ*, most of the *Histeridæ*, all the *Silphidæ*, very many of the *Nitidulidæ*, *Trichopterygidæ*, and other groups are necrophagous, that is, feed on dead or decaying animal matter. These beetles are the scavengers of Nature, and we can better understand the reverence paid by the Egyptians to their huge *Scarabæi*, of which we so often find representations in the mummy-cases, when we remember how quickly they remove ordure and offensive substances from the ground; many of these beetles deposit their eggs in a ball of dung, and roll them in the sand until they have hardened into a regular cocoon; the young *larvæ*, when hatched, find abundance of their natural food around them, and when this is consumed they are just ready to turn into the pupa state, and soon emerge as perfect beetles from their cases; it is very easy, then, to see what an important part they play as sanitary authorities in tropical countries where such matters are entirely neglected.

The ancients were well acquainted with the dung beetles; we have one of the first records of Coleoptera in Aristophanes' "Pax," where he opens the play by describing two attendants as feeding one of these beetles with his usual food, and expressing great surprise at the way he rolled it up. We have not, however, space to dwell upon these parts of the subject, and must turn to our British species; many of our beetles simply burrow in dung, but some, like *Copris* (our only true *Scarabidæ*), *Geotrupes*, &c., make holes, and deposit their eggs enveloped in a mass of dung at the bottom, thus helping indirectly to manure the ground. *Copris* is a decidedly rare beetle, but may be found in some abundance near Richmond; the species of *Geotrupes* are, as a rule, very common, and often cause much annoyance by dashing up against people on summer evenings in their blundering flight.

If any person wishes to work dung and such like localities without any risk of contamination, the best plan is to throw the droppings into a pail of water, when the beetles rise to the surface, and may be easily secured; this plan is, however, only feasible when we are near home. An ordinary fern-trowel is very useful, and might be supplemented by a pair of insect-forceps, which would serve perfectly to pick up the insects with, as they mostly have strong integuments.

Fresh dung is of very little use, except for an occasional rarity settling upon it, like *Emus hirtus*, which may occur once in a lifetime; it is of more use to the lepidopterist as an attraction for *A. Iris* than to the coleopterist. After it has partially dried, however, it will be found to contain numberless species; many of these are found in hot-beds, but these have before been noticed.

The beetle that usually attracts notice on half-dried cow-dung is *Sphæridium scarabæoides*, which basks on the top in the sun, but disappears on a slight alarm. *Cercyons* swarm both in cow- and horse-dung; these are necessarily classed with the *Hydrophilidæ*, from which they cannot well be separated; but by their broad mentum and distant labial palpi they come so close to the *Leptinidæ* and *Silphidæ* that they might easily, and perhaps more naturally, be placed with them. *Cercyons* and *Histers* are usually considered to be exceedingly hard to set, but if taken when properly relaxed they are very easy; if any difficulty is found they may be set on their back in thick gum-arabic, and, when they have quite dried, their legs may be brushed out; a little jerk will then turn them over, and they may be gummed down, and the gum-arabic that remains on their backs may be washed off with benzine or spirits of wine. This applies to all the small globular beetles. No forcing will set the legs of *Histers*, but they may be easily coaxed, if their natural direction is followed.

The *Aphodii* are another group that are hardly ever unrepresented. Some of the species are very common; some, however, are rare, but occasionally turn up plentifully. Mr. T. Wood and Mr. Bedford Pim last year found the rare *Aphodius porcus* in profusion near London; the rarest species appears to be *A. scrofa*, of which one example has occurred near Southport. Among other rare species we may mention *A. Zenkeri*, taken in numbers by Dr. Power at Mickleham; *A. lividus*, recorded from Darenth Wood; *A. consputus* from Kent; *A. quadrimaculatus* from Coombe Wood; and *A. nemoralis* from Rannoch. *A. fœtidus* has been taken in some numbers near Manchester by Mr. G. Chappell and others; and *A. Lapponum* is very common in Scotland. *A. nitidulus*, *A. rufescens* (with a curious dark variety), and *A. scybalarius* are common near the sea-shore in some localities.

The *Onthophagi* do not seem to be altogether dung-feeders, as their name seems to imply, as they may also be found in dead birds and animals; the scarcest species, *O. taurus*, is doubtfully indigenous. Most of our species come from the Channel Islands; the other species, except perhaps *O. nutans*, seem to be common in many districts.

The same remark applies to the *Philonthi*, and in fact the *Staphylinidæ* in general; it would take too long here to attempt to discuss the species of this large group that are found in dung or dead animals; no collector can even pretend to get a collection together without attending carefully to the species thus found.

Of the *Histeridæ*, the *Saprini* are usually to be found under dung. I once took the rare *Saprinus immundus* in some numbers near Hunstanton, Norfolk, and with it *S. metallicus* and *S. maritimus; Saprinus virescens* has been recorded from Swansea. The *Histers* proper are found sometimes in dung, sometimes in dead birds and animals, and sometimes in fungi; one or two, such as *Hister bimaculatus* and *H. 12-striatus*, seem usually to occur in hot-beds; some of the *Histeridæ* are rotten-wood feeders, while one or two are parasitic in ants' nests; so they are rather a ubiquitous family. Some of the larger species may almost always be found under dead birds, especially in woods. A game-keeper's-tree, with vermin nailed to it, in a wood, is said by Mr. Rye to be the luckiest thing to find; out of a dead hedgehog suspended to a bush I one day beat quite a hail of *Choleva fumata* and *Homalia.*

I have, however, found birds on the ground most productive, especially a dead rook in the spring, if placed in a hole under trees and covered lightly with moss and grass; such a trap will last for weeks, and quite set up one's collection, especially as a beginner, with *Cholevæ, Philonthi, Aleocharæ, Atomariæ, Nitidulidæ,* and many other species. *Tachini* are best obtained in this way; one of the few specimens of *Tachinus rufipennis* recorded as British was taken from a dead grouse on Kettlewell Moor, Yorkshire; and a great number of very good species have thus been obtained on the Scotch moors.

It is as well to remember that species of the genus *Necrophorus* should be collected from birds and small animals, and not from larger subjects, as, if so collected, they have no perceptible odour, if well-dried; as the species are almost all common, this note is worth observing: with *Histers* and smaller beetles it makes no difference.

Dry fish thrown up upon the shore, above high-water mark, should not be passed over; many good beetles, especially *Aleocharæ*, are found under them. *Creophilus maxillosus* is always abundant in such localities, and the variety *ciliaris* is well worth looking for.

The species of the genus *Silpha* are to be found in all places where there is high game to attract them; with the exception of *S. dispar* and *S. reticulata,* they are not uncommon. The rare *Sphærites glabratus* is found near Rannoch in dry dead animals, and *in dung.*

The species of *Dermestes* are also, more especially in the larval state, necrophagous; the beetles themselves may be found in dry dead animals, as also in skins, as their name implies. Stephens (Illust. iii. 123) records the capture of a considerable number of specimens of *Dermestes tessellatus*, both in the larva and imago states, in an oyster on the beach off Shoreham, in Sussex; he also mentions the fact of having seen many ship-loads of hides from Brazil infested with *D. vulpinus*, which he concludes not to be an indigenous species.

The *Trogidæ* are fond of old horns, and may be found in abundance among them, together with *Omosita*, and other kindred species; they are also found in dead animals. *Trox hispidus* is extremely rare; *T. sabulosus* is not uncommon in some localities; *T. scaber* is the commonest species, and it appears to be occasionally found in decaying wood, as well as in its usual habitats.

Carabidæ, and species of other genera that are not truly necrophagous, are often found with the beetles above mentioned, perhaps attracted by the abundance of their living prey, but apparently themselves too ready to take part in the feast; it well known how freely large *Carabidæ* come to sugar, so that it is evident that they are not discriminating in their tastes.

The School House, Lincoln, October 16, 1882.

THE MACRO-LEPIDOPTERA OF THE ISLAND OF ARRAN.

By J. Jenner Weir, F.L.S., F.Z.S.

From the latter end of April till the middle of August Mr. M'Arthur was this year collecting Lepidoptera in the Island of Arran; and as he has kindly permitted me to inspect the captures thus made, I am able to offer some observations on the Macro-Lepidoptera of this hitherto little-known island.

The geology of the island is very varied, more so than any other part of the British isles of equal extent; but as I am not able to ascertain on which particular formation the insects were captured, that part of the subject must be left undealt with.

The following butterflies were seen or taken, *viz.*:—

Pieris brassicæ.
,, napi.
Argynnis Aglaia.
,, Selene.
Vanessa urticæ.
Satyrus Semele.
Satyrus Janira.
Chortobius Davus.
,, Pamphilus.
Thecla rubi.
Polyommatus Phlæas.
Lycæna Icarus.

Unfortunately Mr. M'Arthur took specimens of *Pieris napi* during the early part of his visit only, and neglected to take those of the summer emergence, so that I remain ignorant as to the appearance of the latter, but they were seen in some abundance; the specimens taken scarcely vary from the spring form of the insect as usually seen in the South of England, but they appear to me to be a shade darker in colour in the male, and the female has the venations of the wings darker than those of any I possess.

The specimens of *Lycæna Icarus* are very brilliant in colour, almost approaching to that of *L. Adonis*, and are larger than any southern-caught specimens I have seen.

The remainder of the butterflies taken do not call for any remark.

The *Sphingidæ* are not well represented, but two species were seen, *viz.*:—

Smerinthus populi and Macroglossa stellatarum.

The Bombyces are better represented. The following species were captured, *viz.*:—

Hepialus hectus.
,, lupulinus.
,, sylvinus.
,, velleda.
,, ,, v. carnus.
,, humuli.
Euthemonia russula.
Chelonia plantaginis.
Arctia fuliginosa.
Bombyx rubi.
,, quercus.
Saturnia carpini.

It is worthy of remark that, within so contracted an area as Arran, the whole of the British species of the genus *Hepialus* were taken; the females of *H. hectus* are very fine; *H. sylvinus* rich in colour; and *H. velleda* as beautifully marked as those from the Shetland Isles; but *H. humuli* in no way approaches the variety *Hethlandica* in the males, but the females have the upper wings of a very rich buff, with bright red markings, and the under wings beautifully suffused with rose-colour.

The following twenty-eight species of Noctuæ were taken, *viz.*:—

Leucania impura.
Charæas graminis.
Mamestra furva.
Grammesia trilinea.
Caradrina cubicularis.
Rusina tenebrosa.
Agrotis exclamationis.
,, porphyrea.
Triphæna pronuba.
Noctua C-Nigrum
,, festiva.
Tæniocampa gothica.
,, rubricosa.
,, instabilis.
Dianthœcia conspersa.
Phlogophora meticulosa.
Euplexia lucipara.
Hadena adusta.
,, glauca.
,, dentina.
,, oleracea.
,, pisi.
Anarta myrtilli.
Plusia V-aureum.
,, gamma.
,, interrogationis.
Stilbia anomola.
Phytometra ænea.

One of the specimens of *Tæniocampa instabilis* is nearly black, but upon the whole the Noctuæ of Arran closely resemble those of the mainland of Scotland.

The following fifty-two species of Geometræ were captured, *viz.*:—

Rumia cratægata.
Venilia maculata.
Angerona prunaria.
Metrocampa margaritata.
Selenia illunaria.
Odontopera bidentata.
Boarmia repandata.
Dasydia obfuscata.
Ephyra porata.
,, pendularia.
Asthena candidata.
Venusia cambricaria.
Acidalia immutata.
Timandra amataria.
Cabera pusaria.
Scodiona belgiaria.
Selidosema plumaria.
Fidonia atomaria.
Ligdia adustata.
Lomaspilis marginata.
Larentia didymata.
,, cæsiata.
,, pectinitaria.
Emmelesia affinitata.
Eupithecia venosata.
,, pulchellata.
,, satyrata.
,, castigata.
,, nanata.
Thera variata.
Ypsipetes impluviata.
,, elutata.
Melanthia ocellata.
Melanippe tristata.
,, rivata.
,, montanata.
,, galiata.
,, fluctuata.
Anticlea rubidata.
Coremia minutata.
,, propugnata.
,, ferrugata.
Camptogramma bilineata.
Lobophora lobulata.
,, polycommata.
Cidaria corylata.

Cidaria immanata.
,, suffumata.
,, silaceata.
Cidaria populata.
Eubolia bipunctaria.
Anaitis plagiata.

Most of the Geometræ mentioned in this list present but little, if any, variation from the normal coloration of the species, but a few call for some remarks. *Boarmia repandata.*—This occurs sparingly, and the colour in no way approaches that of the variety *Sodorensium.* *Ypsipetes elutata.*—There appears to be in Arran two races of this insect: one of the usual size and colour of the southern varieties, and the other the small and dark northern variety; the former inhabits the low grounds and feeds on the sallow, the latter is found higher up in the mountains and apparently feeds on the heath. I have little doubt but that the insects of Arran are very varied, its geological formation consisting of such different strata as Devonian, Lias, Oölite, Silurian, Granite, and other rocks. *Larentia pectinitaria.*—Particularly large and richly coloured. *Melanippe fluctuata.*—Very dark, and much suffused with black. *Cidaria immanata.*—A most interesting series of this species was taken, although there is some range of variation, yet the prevailing colour of all is greyish; in fact at a little distance they could scarcely be distinguished from the *Cidaria russata* taken in the Outer Hebrides. It is remarkable that *C. immanata* has been taken in Shetland and Arran; in the former islands the insect—unlike those of Arran—exhibits a prevailing reddish hue, but in neither of these islands, so far as I know, does *C. russata* occur; but in the Hebrides it does not appear that *C. immanata* has hitherto been found, *C. russata* only.

I have taken great care to verify the above singular case of geographical distribution, and I trust that future investigation will throw more light on the subject.

These expeditions to the remote islands of Scotland are not undertaken without great sacrifice of comfort, and are attended with risk to the health; and I regret that Mr. M'Arthur was seriously ill during his visit to the Hebrides in the early part of this year, or I have no doubt he would have added to our knowledge of the Lepidoptera of those islands.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Lepidoptera observed in Surrey. — Observing in this month's 'Entomologist' that reference is made to the scarcity or total failure of imagos of Lepidoptera during the present season, even in the case of some of the commonest and most widely distributed species, I send the following list of species, which I noticed to-day whilst walking between Witley and Farnham, by way of Thursley and Elstead. The following species were very abundant, viz., *Satyrus Janira*, *S. Tithonus*, *S. Megæra*, *Hesperia linea*, *Pieris brassicæ*, and *P. rapæ*. I saw numerous examples of *Vanessa urticæ*, *V. Io*, *Satyrus Hyperanthus*, *S. Ægeria*, *Chortobius Pamphilus*, *Pieris napi*, and *Polyommatus Phlæas;* and single specimens of *Argynnis Paphia*, *Gonepteryx rhamni* (male), and *Lycæna Alexis*, the scarcity of the last-named being remarkable. At one point *Satyrus Semele* was abundant flying along, and alighting upon, a rough bank at the edge of a wood, which was covered with *Calluna vulgaris* and *Erica cinerea*, with occasional patches of *Erica tetralix;* but I did not see a single specimen of this species on any of the commons which lie between Witley and Farnham: though a few years since, and I suppose in most seasons, it was to be seen flying over the commons between Milford and Hindhead, and in fact for miles round Guildford, wherever occurs the rough and broken ground, covered with the above three species of heather, in which this species seems to delight.—George W. Oldfield; 48, Beaumont Street, Devonshire Place, W., August 7, 1882.

Lepidoptera near Portsmouth.—On the 28th of July there hatched in my breeding-cage a male var. of *Lasiocampa quercus*. The colour is deep chocolate, with the usual white spot in the centre of the fore wings; the stripe across both pairs of which is narrow and of a deep green colour, and the fringe of the under wings is the same colour as the stripe. The larva was black, with the usual white markings; the cocoon was also black. In Stakes Wood, on the 7th of this month, I took a specimen of the larva of *Stauropus fagi* feeding on birch; it died on the 11th. This summer Mr. Larcom and I reared a specimen each of *Smerinthus populi* with a mauve-pink tinge to the wings. Several specimens of *Acherontia Atropos* have been taken here and at Gosport. Four years ago Mr. Larcom took a specimen of Sphinx *convolvuli* at the Gosport Railway-station; he also captured a pair last season at his residence in Shaftesbury Terrace.—W. V. PEARCE; 42, St. John's Street, Buckland, Portsmouth, August 21, 1882.

LEPIDOPTERA IN THE FENS.—Although this year Lepidoptera are somewhat scarce in this neighbourhood, yet we have met with a notable exception or two. *Papilio Machaon* literally swarmed early in July, at Wicken Fen, Cambs. We captured a dozen in half an hour, and continued to net them at about the same rate for half a day. The man who lives near the Fen, to superintend the draining machinery, also says that they were abundant, and he often keeps the larvæ in his engine-room, which turn to chrysalids in the autumn and into butterflies at irregular periods during the winter commencing from early in December. The larvæ of *Anticlea badiata* and *A. derivata* were exceedingly common on the dog-rose bushes in June. We obtained a large number by the usual method of beating the bushes over an umbrella.—HERBERT E. NORRIS; St. Ives, Hunts, October 9, 1882.

NOTES ON LEPIDOPTERA IN WALES.—Having read in a recent number of the 'Entomologist' about the scarcity of Lepidoptera this year, I give a brief account of my own experience this season, as it may interest some of your readers. The only butterfly of note that I captured was a fine specimen of *Apatura Iris*, the only one I have seen this year, on June 13th, at Portmadoc; it was feeding on a dead water-rat. The only Nocturni of note were three specimens of *Smerinthus ocellatus*, all males. The total absence here of *Pieris brassicæ* and *P. napi* is a striking fact, as there were plenty to be caught and seen last year. I have also from this place the following:—*Pieris cratægi*, *Vanessa C-album*, *V. Atalanta*, *Argynnis Aglaia*, and *Hesperia Paniscus*. The above amount to all my collection this season, except an *Agrotis Ashworthii* which was presented to me by a friend. The same story comes from most of my friends and the members of the Field Club over which I preside, many members having given up collecting in despair. I may also state the total failure which I experienced in larvæ and pupæ hunting, being rewarded by one pupa of *Endromis versicolor*. The only butterfly that was seen in any quantity was *Argynnis Euphrosyne*. My breeding-cages have been empty all through the season. Altogether the additions to my collection, to compare with last year, amount to nothing. It is very disheartening, especially to a hard-working entomologist. I agree with your York correspondent in the July number of the 'Entomologist' as to the cause of the scarcity of Lepidoptera.—R. W. Hughes; 24, Church Street, Blaenau, Festiniog, N. Wales.

Lepidoptera in Aberdeen and Kincardineshire.—Insects in this part of the country have been exceedingly scarce this season, especially at sugar, only a very few of the more common species putting in an appearance. In the month of May scarcely an insect was to be seen at sugar, however fine the weather. June was somewhat better, but the insects which in former years used to come to sugar in great abundance, such as *Cymatophora duplaris*, *Acronycta menyanthidis*, *Hadena adusta*, and *H. rectilinea*, I could only find about half a dozen of each this season, although I sugared three or four times a week; and in July could only find *Triphæna orbona* and *T. pronuba*. Along the coast of Kincardineshire in July I had more success. *Argynnis Aglaia*, *A. Selene*, *Satyrus Janira*, *Lycæna Alexis*, and *L. Artaxerxes* were fairly common, but the usually common *L. Alsus* were not to be seen. *Hepialus lupulinus*, *H. velleda*, *H. humuli*, *Zygæna filipendulæ*, and *Lithosia complanula* were by no means scarce. Of *Dasydia obfuscata* only a few, but in fine condition. *Plusia bractea* last year turned up about the end of July, but as yet has not been seen. Larvæ seem to be more abundant: *Trichiura cratægi*, *Bombyx callunæ*, *Saturnia carpini*, *Dicranura vinula*, *Notodonta dictæa*, *N. ziczac*, *Acronycta menyanthidis*, and *A. myricæ* were quite plentiful. One curious fact I should like to mention regarding *Plusia interrogationis* larvæ. On May 27th I took about a dozen of the above larvæ, and, strange to say, only got one single imago, all the others being filled with ichneumon larvæ; while in former years I scarcely ever failed in rearing them.—J. Mundie; 22, Watson Street, Aberdeen, August 4, 1882.

Lepidoptera in Scotland.—Observing the different reports of collectors on the scarcity of Lepidoptera this season, my experience at Dollar, near Stirling, and also in the neighbourhood of Edinburgh, may perhaps be interesting to some of your readers. Butterflies have all the season been very scarce; even *Pieris rapæ* and *P. brassicæ*, which are generally very numerous in these districts, have been unusually rare. *Calocampa exoleta*, *C. vetusta*, *Hadena pisi*, *H. oleracea*, Triphæna orbona, *T. janthina*, *Charæas graminis*, *Agrotis nigricans*, *Hydræcia micacea*, and *Xanthia cerago* have come very plentifully to sugar. *Triphæna pronuba*, *Xylophasia polyodon*, *Agrotis tritici*, and *Plusia gamma*, in comparison with last season, have been scarce. *Cidaria miata*, *Thera variata*, and *T. firmata* have been decidedly plentiful, the latter common in fir woods, where the larvæ may also be found. The Micros on the whole have been plentiful, including *Crambus falsellus*, *C. margaritellus*, *Odontia dentalis*, *Scoparia murana*, *Roxana arcuana*, and *Epigraphia Steinkellneriana*. The larvæ of *Hadena pisi* have been over-abundant, whole acres of bracken (*Pteris aquilina*) having been stripped by them in the neighbourhood of Dollar; they also attacked the lady-fern (*Athyrium Filix-fœmina*). I may safely add that the Lepidoptera generally, with the exception of the butterflies, have been in these districts quite as numerous as last season.—Wilfred W. O. Beveridge; 8, Eldon Street, Edinburgh, October 23, 1882.

Notes on the Season.—With regard to the Lepidoptera of the past season, I have to write in the like melancholy strain adopted by most of your correspondents, for, as far as this neighbourhood is concerned, I never remember such a dearth of insects of all kinds. Only one butterfly was common, and that was *Vanessa urticæ;* and this species seemed to make up in numbers for the scarcity of others, being more than usually abundant. Sugar was a complete failure: after having tried almost every night for about two months and being rewarded with three *Noctua rubi*, I gave up in disgust. Amongst larvæ I had *Chærocampa elpenor*, *Smerinthus tiliæ*, and *Cerura vinula*, and few enough of these. I send these remarks, which are of value only as showing in yet another district the remarkable paucity of Lepidoptera, to be attributed without doubt to the severe storm on 29th April last.—Joseph Anderson, jun.; Chichester.

Notes from Folkestone.—As complaints about the dearth of Lepidoptera this autumn seem general, it will perhaps not be deemed impertinent if I give the result of a week's collecting at Folkestone, ending September 23rd, 1882:—*Vanessa urticæ*, *V. Io*, *V. Atalanta*, *V. cardui*, *Satyrus Megæra*, *S. Ægeria*, *S. Semele*, *S. Janira*, *Chortobius Pamphilus*, *Lycæna Agestis*, *L. Alexis*, *L. Adonis*, *L. Corydon*, *Colias Edusa* (var. *Helice* taken the same day), *Gonepteryx Rhamni*, *Pieris napi*, *P. rapæ*, *P. brassicæ*, *Hesperia linea*, and *Polyommatus Phlæas.* Amongst the moths I was not so successful: *Plusia gamma* and *Noctua xanthographa* swarmed in sunshine and shade. Three nights' sugaring in the Warren did not result in much, probably owing to prevailing north-east winds and moonlight nights. *Phlogophora meticulosa* just out, *ad libitum.* I counted nine specimens on one post, with their wings not yet dried. *Noctua c-nigrum*, *Agrotis saucia*, and *Calocampa vetusta* were all I met with. I also came across an interesting fact, which I had not heard of before, viz., the cannibalistic propensities of a large species of grasshopper. Whilst having a rest, after working for *Lycæna Adonis*, I saw a specimen coolly devouring a smaller comrade, which he held in his fore feet, something like a squirrel does a nut, and chirruping merrily the while.—T. W. HALL; 279, Lewisham High Road, London, S.E.

[This reminds me of a recently overheard conversation between two boys, as follows:—"Teddy, do you know what that grasshopper is doing?" "No, Ginx." "Why, he is saying grace before he eats his brother!"—so others have noticed this habit. —J. T. C.]

COLIAS EDUSA IN SUSSEX.—Yesterday, while driving to Hailsham, I was pleased to see a fine male *C. Edusa* flying by the wood-side.—ROSA M. SOTHEBY; Rozel, Upperton Gardens, Eastbourne, August 30, 1882.

CAPTURE OF COLIAS HELICE NEAR NORWICH.—I have just seen a fine *Colias Helice*, which was taken by a collector at Heigham, near this city, about the 15th of September. This specimen was found at dusk at rest on the leaf of a cabbage growing in his garden. As the result of inquiries this appears to be the only specimen of *Colias* observed in the neighbourhood of Norwich this season. It would be interesting to know whether *C. Edusa* or its variety have been seen or captured elsewhere.—R. LADDIMAN; Upper Hellesdon, Norwich.

ARGYNNIS LATHONIA AT DOVER.—During a recent sojourn with one of my sons at this place, we carefully worked, on every favourable opportunity, the known haunts of this beautiful little species, being once or twice accompanied by Mr. Gray; but although we saw two *Lathonia* on the wing, we failed to capture either. On the last day of our stay, however (the 13th inst.), in company with Mr. Gray and his eldest son, we, at my suggestion, tried another (though likely-looking) piece of ground, and had not long commenced operations before a specimen was started up and taken by Mr. Gray; and shortly afterwards I had the pleasure of capturing another. We therefore decided to remain where we were rather than revert to the old locality, and after a long morning's work our perseverance was rewarded by the muster amongst us of no less than eight captures, our only regret being that we had not discovered this resort sooner, as some of the specimens were rather worn and broken. The following is, I believe, a correct list of all other captures this season at Dover:—One taken by a lad on the 10th (near the old ground); three (one being a cripple that could not fly far) by Mr. Gray, jun., and one by another gentleman on the 14th; two by Mr. Webb, and two by Mr. Gray's sons on the 15th; one by Mr. Davis, of Dover, and two by Mr. Gray on the 17th; one by Mr. G. Gray, jun., on the 18th; one by Mr. Gray, jun., and one by a lad (at some distance from this spot) on the 20th; and two by Mr. G. Gray, jun., on the 21st; making twenty-five in all, the "Queen of Spain" thus proving herself a brilliant exception to the general entomological poverty of the season. Mr. Gray has kindly forwarded to me (alive) day by day, as taken, most of his own and his sons' captures. I would only add that during the whole of our stay the prevailing winds were rather towards than from the French coast.—E. SABINE; 17, The Villas, Erith, September 27. 1882.

LYCÆNA CORYDON IN KENT.—Although the season has been a bad one for Lepidoptera generally, yet in justice to some of the Diurni I must say that I have found them more than usually abundant, such as *Gonepteryx rhamni*, *Satyrus hyperanthus*, and *Lycæna Corydon;* indeed the latter were out in countless thousands at one inland spot in this county, and I was able to secure a very fine lot of varieties, including some beautiful upper sides of the female, in all shades of colour from light brown to almost black, a good number having much blue on all the wings. I attribute my success in a great measure to the place being (as I believe) quite unknown to collectors, having never met with or seen anyone about; and a remark made to me by a workman in the locality, "Sir, I've heerd tell of you butterfly-catcher gentlemen, but I never seed one before, there!" would seem to confirm this idea. From a conservative point of view this remark was very satisfactory.—E. Sabine; 17, The Villas, Erith.

Lycæna Bœtica near Bournemouth.—I have to record a most interesting addition to the Diurni of this locality during the present week. On Monday last, Oct. 2nd, it appears that Miss Staples, daughter of Lady Staples, residing in Bournemouth, went out on the moor opposite the West Railway-station for the purpose of obtaining a red admiral to sketch and paint, when she saw and netted what she at first supposed—from its size, colour, and manner of flight—to be a common blue, but which to her surprise turned out to be a veritable specimen of *L. Bœtica.* As Miss Staples is not making any collection of Lepidoptera herself, she has, after painting the specimen, kindly presented it to me, with a detailed statement of all the circumstances connected with its capture. That there may be no doubt as to the identity of the species I purpose submitting the specimen to the inspection of Mr. Carrington, who will, I hope, favour us with an editorial note.—W. McRae; Westbourne House, Bournemouth, October 7, 1882.

[The specimen sent was a veritable *L. Bœtica.*—J. T. C.]

On the Emergence of Butterflies.—Mr. J. N. Pierce, of Liverpool, has favoured me with the following communication in reply to my note on *Apatura Iris* in the 'Entomologist' (xv. 188), in which I desired information respecting the habit of different species of butterflies, upon their emergence, clinging, or not, to the empty chrysalis-case, and more especially as to the reversal of their position on the puparium after a certain time, as noticed in the case of *Apatura Iris.* It may be interesting to others, as well as to myself, to know the result of his observations, and I therefore forward them:—"With reference to your note in the 'Entomologist,' I have just finished breeding a quantity of *Vanessa Io*, *V. urticæ*, and *Erebia Medea,* and notice this:—*Vanessa Io.*—Many of these imagines on emerging cling to the pupa-case; but not in every case, some going to the side,—these may go after their wings are developed,—and remain clinging to the empty pupa-shell wings downward. I have not noticed any reverse their position, and do not think they do so. *Vanessa urticæ.*—Some leave the pupa and go to the side of the breeding-cage to develop their wings, whilst others remain on the pupa-case to perform the operation; in both instances hanging with their wings down, and I have not noticed any reverse the position. *Erebia Medea.*—These leave the pupa *immediately* and walk up the grass stems, or side of the breeding-cage, and hang with their wings down to develop." Perhaps other lepidopterists may give us their experience of other species.—JOSEPH ANDERSON, JUN.; Chichester, September, 1882.

ACHERONTIA ATROPOS IN CO. SLIGO.—A fine specimen of the above was taken by me on Sept. 24th. This is the first I have known to be taken in this part of Ireland.—PERCY H. RUSS; Culleenamore, Sligo.

ACHERONTIA ATROPOS IN SCOTLAND.—A splendid specimen of *Acherontia Atropos* was recently taken in one of the back passages in Yester House (the residence of the Marquis of Tweeddale), situated near Gifford, Haddingtonshire. The moth measured six inches from tip to tip of the wings.—G. M. BROTHERSTON; 18, St. John Street, Edinburgh, October, 1882.

EMMELESIA BLANDIATA.—In reply to the query attached to the notice I sent you respecting the capture of *E. Blandiata* (Entom. xv. 235) I am "quite sure" as to the identity of the said insect. It was among numerous other species which I captured in Sussex and took to Mr. Hodgkinson for the purpose of having them named, and it was he who pointed it out. I was quite unaware of the species and its habitat at the time.—[Rev.] H. T. HUTCHINSON; Whalley, Blackburn, Lanc., Oct. 25, 1882.

REPUTED PARTHENOGENESIS OF ANARTA MYRTILLI.—Having noticed what to me is a curious thing, I venture to send you the following note:—A few weeks ago my son (aged four years) brought me a pupa of *Anarta myrtilli,* which he had found in the road, and I put it in a tin box to please him, thinking it would not survive the pressure it had received, as it was nearly flat. To-day, the 14th July, requiring a box for collecting, on opening the lid I saw the remains of the imago of *A. myrtilli* and the eggs it had deposited on the side of the box, with dust at the bottom, which through curiosity I put under a pocket-lens, when to my surprise I saw a number of small larvæ. This led me to examine the eggs, and I found that they had all hatched. Nothing could possibly have got into the box, as it was in my desk, and I had almost forgotten it. Of course the larvæ were all dead, or I should have tried to rear them. Perhaps your readers may enlighten me on the subject.—J. A. WATSON; Carsick Hill, near Sheffield.

RETINIA DUPLANA.—Mr. Barrett informs me that my supposed *Retinia duplana* is a male of *Eriopsela quadrana.* The specimen was named from a type in Mr. Hodgkinson's collection, and the mistake is thus accounted for. I owe Mr. Barrett my thanks for thus putting the identity of the insect beyond a doubt.—J. H. THRELFALL; Preston.

PTEROPHORUS SEROTINUS. — What a long time this species continues on the wing! In an old rough field, overgrown with *Scabiosa*, adjoining Lepton Great Wood, near here, I have taken it this year continually from June 12th until to-day, October 14th. In July it was in great abundance, and has gradually decreased in numbers since. I only took it in fine condition early in the season, or should have thought the late specimens belonged to a second brood.—GEO. T. PORRITT; Huddersfield.

CISSOPHAGUS HEDERÆ, *Schmidt.*—Dr. Capron, in last month's 'Entomologist' (Entom. xv. 212), expressed his opinion that *Cissophagus hederæ* ought not to be omitted from our lists. He is certainly right in the matter, apart from the fact that he has himself taken the insect. In the 'Entomologist's Annual' for 1872, p. 86, Mr. Rye speaks of it as a "somewhat rare British insect;" and reference will be found to it in Ent. Mo. Mag. viii. 107. The genus *Cissophagus* was founded by Chapuis to contain this insect, and he also founded the genus *Xylechinus* for *Carphoborus pilosus;* neither of these genera, however, are now admitted into the European catalogue; *Carphoborus* is made to include *X. pilosus*, and *Cissophagus hederæ* is considered a part of the genus *Hylurgus.* To this genus we must also add in the British list, *Hylurgus minor*, Hart., and probably *H. ligniperda*, Fabr., of which I believe there is a specimen in Mr. Rye's collection, now in the possession of Mr. Mason. It is an ordinary south and mid-European species. We must also insert close to *Scolytus* the very distinct *Polygraphus pubescens*, Fabr., which was taken some years ago by Mr. Lawson, near Scarborough, under fir bark: a full account of this insect may be found in Ent. Ann., 1872, 88. It is also probable that one *Scolytus*, at least, and another *Pityophthorus*, will have to be added to the British list, so that we may see that a good deal yet remains to be done among our wood-borers, and every collector should be careful to examine closely, and set on one side, any forms of which he is doubtful. — [Rev.] W. W. FOWLER; Lincoln, September 15, 1882.

GALLS OF GYMNETRON VILLOSULUM, *Gyllenhal*, AND LARVÆ OF ATHALIA ANNULATA (?), *Klug.*, ON VERONICA ANAGALLIS.—Dr. Paxton, of this town, having noticed for some years past certain galls on *Veronica anagallis* growing on the banks of the canal here, and on the sides of the River Lavant, at Lavant, brought them to me for determination. The capsules of the plant are transformed into a roundish green gall, about the size of a dried pea, some of which upon opening contained the larvæ, some the pupæ, of a beetle, and others the beetle itself. Seeing it to be a weevil, but not knowing the species, I sent them to our good friend Mr. Fitch, who is always so ready to impart his varied and valuable information. From him I learn that the beetle is *Gymnetron villosulum* of Gyllenhal; he also adds that he has neither seen the gall himself, nor does Müller mention it in his list of gall-makers in the 'Annual' for 1872. Last Saturday, upon searching *Veronica anagallis* for more galls, I found the larva of a sawfly feeding upon this plant; these I collected, and forwarded to Mr. Fitch for identification. He writes:—"The sawfly larvæ are those of *Athalia annulata*, Klug., I believe, but try to breed the imagos; the larvæ will soon go into the earth, but will not pupate until the spring, so do not disturb them. The larvæ greatly resemble those of the turnip 'nigger' (*Athalia spinarum*), which is well figured in Curtis's 'Farm Insects,' pl. B, and in George Newport's essay, published by the Entomological Society."—JOSEPH ANDERSON, jun.; Chichester.

NAPHTHALINE.—In the July number of the 'Entomologist' is an article, by Mr. Jenner Weir, on the use of naphthaline. I see that in his experience of it, prepared in cones, it tends to grease and to discolour cabinet-drawers; for the latter I cannot answer but the white crystals of naphthaline I have used, and know a great many who use it find it is not only a preventative against mites but that grease does not appear in the drawers when naphthaline is used in the camphor-cells. I can only say I have used naphthaline for about two years, and, so far as I can see, there is nothing half so good all round both against mites and grease. In many cases I find camphor is still used, and generally plenty of grease can be seen on nearly all the insects.—EDWARD COOKE; 30, Museum Street, W.C., August 16, 1882.

PREVENTION OF MOULD.—The Rev. J. Tasker (Entom. xv. 233) says that glacial carbolic acid is a perfect remedy for mould. Now, as this preventative will doubtless be tried by some of your readers, and as I suffered some years since from using it precisely in the manner described by your correspondent, and which, I may add, was recommended to me by good authority, I should like, by way of a caution, to let others know the result of my experiment. The prepared pads of cotton-wool were placed in my drawers of Lepidoptera. This was no sooner done than it was evident that mould could not exist in its company; but ere sufficient time had elapsed for me to thank my informer, and congratulate myself upon the success obtained, I discovered another and more serious evil in connection with the Whites, which in some instances were fast turning to a dirty cream-colour; this fact was most conspicuous with *Liparis salicis*, *Dysthymia Acontia*, and *Melanippe hastata*, but, on the other hand, none of the Diurni had changed in appearance. Here was a curious problem, but one easy to solve, as the former species had been cyanised with spirits of wine possessing the orthodox proportion of corrosive sublimate, while the latter had not been so treated. A subsequent special experiment corroborated the previous result, and at once clearly demonstrated that either the use of glacial carbolic acid, or cyanising insects which happened to have white upon them, must be abandoned. — H. T. DOBSON, jun., New Malden, Surrey, Oct. 21, 1882.

ERRATUM.—At p. 238 the capture of *Harpalus oblongiusculus* is stated to have been made by the Rev. O. P. Cambridge. The capture was made and the communication sent by Mr. Frederick O. P. Cambridge.

THE ENTOMOLOGIST.

Vol. XV.] DECEMBER, 1882. [No. 235.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. X.—FUNGI, FENCES, SAP, FAGGOTS, &c.

In the autumn nothing repays a collector better than working at Fungi; not that Fungi at any season of the year are not equally productive, but in the autumn the Fungi themselves are more abundant, and other methods of collecting begin to fail. Among the beetles found in Fungi, species of *Gyrophæna*, *Bolitochara*, *Bolitobius*, *Mycetophagus*, *Proteinus*, *Megarthrus*, *Cychramus*, *Epuræa*, &c., are very conspicuous; *Oxypoda alternans* and *Autalia impressa* are nearly always to be found; and the following *Homalotæ* occur:—*H. fungivora*, *H. fungicola*, *H. boletobia*, *H. nigritula*, *H. sodalis*, *H. gagatina*, *H. angusticollis*, *H. corvina*, and *H. oblita*; *Agaricochara lævicollis* is rarely found, but *Gyrophænæ* of various species are almost always present; *Oxyporus rufus* is occasionally found in some numbers, mining transverse galleries through the gills of large Fungi. All, or nearly all, the above-mentioned beetles occur in the large soft-stemmed Fungi that are so common in every wood in autumn; but, besides these, boleti and all fungoid growths on trunks of trees, whether high up or lower down near the roots, should be carefully examined. *Engis humeralis* and *rufifrons*, *Ennearthron fronticorne*, *Octotemnus glabriculus*, *Cis alni*, *Triplax russica*, *Tetratoma fungorum*, *Triphyllus suturalis*, *Rhizophagi*, and many others may be obtained in these: the best plan is to collect a bag full of boleti and keep the contents at home in an old box; large numbers of good species may be bred out in this way. Even the small scaly Fungi that are found on trunks of trees lying on the ground will sometimes produce very good beetles.

The rare *Sphindus dubius* and *Aspidiphorus orbiculatus* have been taken from fungus on fir-trees. *Sphindus dubius* has also been found in black powdery fungus on alder, together with *Lathridius rugosus* and species of *Liodes*. *Lathridius testaceus* has been obtained from the same kind of fungus on beech bark, and other rare *Lathridii*, such as *L. filiformis*, have occurred in Fungi. *Carida flexuosa* has been taken in Scotland in some numbers, in hard woody fungus on alder, *Epuræa variegata* at Rannoch, in fungus on rotten birches, and *Rhizophagus cribratus* in various localities. Mr. J. J. Walker took a large number of this rather rare species in Ireland a short while before he last left England. The exceedingly rare *Diaperis boleti* has not been taken for years, but is recorded as having been found once or twice in some numbers many years ago in boleti, by Mr. Kirby near Barham, and I believe in the New Forest by Mr. Dale. Most of the old collections contain one specimen at least, and there is no reason why it should not again turn up like *Spercheus*. *Heledona agricola* sometimes occurs very abundantly in boleti, and *Bolitophagus reticulatus* is a rarer species of the Heteromera that is found in Scotland in the same habitat. *Agathidia*, *Cryptophagi*, *Cholevæ*, *Histers*, and sometimes good *Philonthi* (such as *P. corvinus* taken by Dr. Power at Mickleham), may be found in Fungi, and probably most collectors could add many species to those above-mentioned: from those, however, that have been mentioned, it may be easily gathered what kinds of beetles may be expected to be met with by a collector. *Anisotoma cinnamomea* is sometimes found in truffles; *Atomaria fimetarii* and *Rhizophagus parallelocollis* have been taken in abundance near York, by Archdeacon Hey, in *Coprinus comatus*, and the *Lycoperdon* or puff-ball almost always yields *Cryptophagus lycoperdi*, and occasionally the much rarer *Lycoperdina bovistæ*. As I said just now that Fungi were productive at any period of the year as well as in autumn, which is generally considered the great time for this method of collecting, I may mention in conclusion that I found a fungus or two near Lincoln on a warm day in May last, which were full of *Epuræa deleta*, *Gyrophænæ*, &c.

It is well-known to collectors of Lepidoptera how profitable a collecting ground a wooden fence or paling is; it is equally good for Coleoptera. Many rare species seem to take pleasure in settling on palings in the sunshine, besides those species that utilise them by boring in them. Mr. S. Stevens has found the very rare *Teretrius picipes* in some numbers on a fence near Norwood, and the almost equally rare *Tillus unifasciatus* and *Lyctus brunneus* sparingly, on the same palings. Good *Staphylinidæ*, such as *Calodera umbrosa*, may be taken in the same way, and many other species. Longicorns are very fond of settling on wooden fences; *Molorchus minor* has been taken on a fence near Hampstead, and the new *Pachyta sexmaculata* was taken not long ago on a fir-paling in Scotland. Certain beetles of course inhabit the interior of the wood; of these *Xyletinus ater* is one of the best. Mr. Hadfield of Newark, one of our oldest collectors, who was a friend of Mr. Dawson's, and helped him with several species for the 'Geodephaga Britannica,' took me a short time ago to see a fence on which he used to take this rare beetle plentifully; the fence, unluckily, had just been removed, but the number of duplicates that Mr. Hadfield had sent away, and still possessed, showed how abundant this rare beetle must have been in that particular locality. One thing must be noticed, and that is, that for the species that settle in the sun and are not borers, the palings must be new; for the boring species they cannot be too old. Some of this class of beetles are parasitic (as *Teretrius picipes* on *Ptilinus*), but it seems possible that some are attracted by the sap and moisture remaining in the new wood. The reason of this probably is that the sap of the wood at first is an attraction, and this leads us to speak of sap as a method of collecting. If the trunk of a tree be examined in the spring after it has been cut down—and trees are usually felled in autumn or winter—it will be found that a large quantity of sap is exuding from them; great numbers of beetles come to this sap, and very good species may be captured among the *Carabidæ*, *Tachini* and other *Staphylinidæ*, *Epuræ*, *Cryptophagidæ*, and many other families. Longicorns are especially fond of sap, and may often be taken in this way, especially in Scotland, where *Cetonia floricola* has been taken at the same sweets. The sap of birch seems very attractive to many varieties, among them *Sphærites glabratus*, *Epuræa silacea*, *E. variegata*, *E. parvula*, and *E. immunda*, and the very rare *Paramecosoma serrata*. In the second year the stump is nearly useless; fresh stumps should be taken note of in the winter and visited in the spring: it is a good plan to pile chips on and around the stumps, as they harbour the beetles and keep them from going away. Chips themselves are exceedingly productive if placed in a heap; *Homalia*, *Philonthi*, *Trichopterygia*, and many others, among them very rare species, may be found by shaking them over paper; single large chips lying on the ground will sometimes be found to have good beetles attached to them or lying under them; among others may be mentioned *Eros Aurora* found in this way at Rannoch.

Faggots are well worth working: these again must be comparatively fresh; an old faggot is of very little use, at least I have never found one that produced much worth having, while faggots that have been cut only a short time and laid on the ground will often be found to swarm with insects. I remember shaking some over a sheet in Sherwood Forest and taking quantities of things. *Lathridius nodifer* of course swarmed, accompanied by one or two of the rarer *Lathridii*, *Epuræa parvula*, *Trichopteryx fascicularis*, and other species. Mr. Matthews, on one occasion, took the rare *Trichopteryx obscæna* in the same way. From faggot-stacks good things like *Cryphalus fagi*, and others, may occasionally be obtained. *Trachodes hispidus* was found in abundance in faggots near Leicester, and I feel certain that it must have been from faggots that Turner obtained such numbers of *Cryphalus tiliæ* near Lincoln; the tree is called "bass" by the natives, and is a species of *Tilia*, but is more of a shrub than a tree, with the growth of a large hazel; there is no trunk or bark for a *Cryphalus* to bore in. I have a faggot at present concealed in the wood where I believe he found it, and hope to turn up this beetle again, though hitherto I have been unsuccessful.

Dry bramble-sticks are very profitable, and in fact dry sticks of any kind. Under dry sticks or faggots laid down in a wood to make a passable road, the late Mr. Garneys once found *Stilicus fragilis* in abundance; Dr. Power and Mr. Fitch shook this same species out of some dry oak-faggots in a wood near Dorking. *Hedobia imperialis*, *Pogonocherus dentatus*, and other species, may be beaten out of dry brambles or hawthorn hedges. The very rare *Tropideres niveirostris* has been taken by beating dry sticks; and from collected dry twigs Mr. Plant, of Leicester, once bred *Tropideres sepicola*. We are, however, now trenching upon the subject of wood-collecting proper, which will be fully treated of in the next paper.

School House, Lincoln, 9th November, 1882.

A DAY'S COLLECTING ON BEN TIGH.

By J. H. Leech.

Having spent a month or so collecting in the Highlands of Inverness and Ross-shire, I think it may interest some of the entomologists of our southern counties to hear a little about Scotch collecting during the past season, I will give a short account of one of the many pleasant days spent in company with Mr. E. G. Meek collecting, and which proved very good, contrary to the experience of many this season.

We were stopping at Invergany, a little village some seven miles or so from Fort Augustus, when we decided to have a day's collecting on Ben Tigh, a mountain about 2800 feet high, situated about six miles from the inn. Making our preparations over-night we retired to rest early, so as to be ready for a hard day's work. On rising, greatly to our delight, we found a cloudless sky and a bright sun; it had been raining almost without intermission for the previous few days. After a hearty Scotch breakfast we were ready for a start, having obtained the "factor's" permission, as Ben Tigh is a strictly preserved deer forest. We first made our way through some woods, composed chiefly of birch and fir, where *Platypteryx lacertula* and *P. falcula* were to be seen at rest, occasionally being tempted to stop and box a *Fidonia brunneata;* this insect which, so far as I have been able to ascertain, has only been taken at Rannoch, was flying very abundantly, though, as usual, rather worn. The reason of its never being taken in fine condition I believe to be this: the food-plant of *F. brunneata*, viz., the bilberry, grows with the common heather, on which the insect always rests in preference to other plants. In this locality the heather is covered with minute cobwebs, in which *F. brunneata*, as I frequently noticed, gets entangled, and damages itself in the rough heather with its efforts to escape. *Acidalia fumata, Larentia cæsiata, Fidonia piniaria, Larentia pectinitaria*, and a host of the commoner Geometræ, were put up at every step; *Cidaria populata* being noticeable from its variableness, some specimens being very dark, and others with the most indistinct markings. *Boarmia repandata, Venusia cambricaria* and *Ellopia fasciaria* were to be seen at rest on the fir trees. We also took a fine dark variety of *Dicranura vinula*, although rather late in the season for it; but we were not yet on proper hunting ground.

Leaving the woods we came upon a fine stretch of open moorland gradually rising to the foot of the mountain,—a very imposing height, from its symmetrical shape, and from the absence of any other mountain in the immediate neighbourhood of corresponding elevation. As we proceeded *Chortobius Davus* was to be seen flying in swarms in every direction, the specimens strongly resembling the Hebridian forms. *C. Pamphilus* was also flying sparingly, looking dwarfed beside its big neighbour; and every now and then a fine *Argynnis Aglaia*, better marked and more powerful than the southern specimens. We captured a very fine specimen of *Lycæna Alexis* (female), the ground colour of the wings being as bright as a male, with all the red spots very distinct, the central spot on the under side of the fore wings showing through in the shape of a white ring, and the costal margin being of a light blue, almost the colour of *Lycæna Corydon*. Here also we boxed some *Crambus ericellus*, the prize of the day; and, as we began to ascend, the pretty little *Emmelesia blandiata* was to be seen in every direction flying in twos and threes, and in the finest possible condition; higher up we came upon *Scopula alpinalis*, just out; also *P. decrepitalis*, one worn specimen; and in a marshy hollow, *Crambus furcatellus* and *C. margaritellus*. The Crowberry was growing plentifully, so we began searching for the pupæ of *Pachnobia hyperborea;* we soon found the larvæ feeding among the roots in the first year's growth; but after half an hour's search we gave it up, as neither of us were "very keen on it." The little Tortrix, *Sericoris irriguana*, was flying about and settling on the moss, so we took a series. The sun was high, and we were beginning to get warm.

After lunch we went on to the top, taking *Psodos trepidaria*, which was out in swarms, though mostly worn. Beyond this nothing fresh occurred at the top; however we were well repaid for our climb by the splendid view,—Ben Nevis, covered with snow, looked quite close. Beneath us were feeding two fine red deer, quite unconscious of our presence, although within 200 yards; and the ptarmigan and blue hares were not at all uncommon; but what attracted us most was a splendid golden eagle flying boldly round, as if astonished at being disturbed. On our way down, besides our former captures, we took some fine varieties of *Bactra lanceolana*, and some *Coccyx ustomaculana*, *Aphelia pratana*, &c.

It now began to look stormy, so as we had our boxes full we made for home. *Lithosia mesomella* was flying in the grassy openings of the woods, and *Hepialus hectus* was common, flying about the fern; *H. velleda* and *H. humuli* were plentiful in open fields, the latter rather like the plain form from Shetland, with dark thorax. As we got near home we were startled by a few heavy drops of rain, and had only just got back when it came down in torrents. We concluded not to sugar; indeed my experience of sugar here has not been pleasant; although we tried very promising localities in the hope of taking *Crymodes exulis*, we never saw anything better than *Acronycta leporina*, *Aplecta herbida*, and the usual band of "sugar robbers."

4, Holland Park, W., November, 1882.

THE LEPIDOPTERA OF HACKNEY MARSHES

By Ernest Anderson.

The Hackney marshes formerly comprised a far larger area suitable for the observations of an entomologist than at present; but every year the buildings encroach from Homerton and Clapton on the one side, and Stratford and Leytonstone on the other. The number of Lepidoptera to be found in the now limited space is, however, still fairly numerous, though unfortunately many species appear in decreasing numbers each year and threaten to disappear altogether very shortly. The cutting down of the splendid row of willows, which a few years ago fringed the Lea for over a mile, gave a severe blow to Entomology in the district, and its effects were perceptible almost immediately in the reduced numbers of willow-feeding species, such as *Cossus ligniperda*, *Liparis salicis*, *Smerinthus populi*, *Catocala nupta*, &c. However, instead of dwelling upon what has been, it will be better, for the benefit of present entomologists, to enumerate those species which may still be observed.

Diurni are poorly represented, *Pieris brassicæ*, *P. rapæ*, and more commonly *P. napi*, together with *Vanessa urticæ*, comprising almost the whole list, relieved by a few *Satyrus Janira* and a stray

Vanessa Atalanta or two. In special years, however, *Vanessa cardui* and *Colias Edusa* have both appeared in considerable abundance, but of course must be considered as visitors only. *Smerinthus populi* is now somewhat scarce, but may still be observed occasionally both in the larval and perfect state upon the willow-trunks; and the pupæ are fairly common in autumn at the roots of those trees. *Cossus ligniperda*, once very common, is now almost rare. *Hepialus lupulinus* flies swiftly at dusk in June, and the larvæ of its congener, *H. humuli*, may be obtained commonly at the roots of dock in May, the perfect insect being observed in countless numbers a month later, the females being busily employed in shooting out their small black eggs amongst the rank herbage.

In the whitethorn hedges the little larvæ of *Nola cucullatella* are busy throughout June, combining with *Yponomeuta padella* and *Tortrix ribeana* to strip almost every leaf; the imagines are equally abundant in July, sitting on twigs of whitethorn and palings. *Arctia caja* is common in the larval state, but the moth is rarely observed. *A. lubricipeda* and *A. menthastri*, it is almost unnecessary to remark, are everywhere. *Liparis salicis* is abundant in all stages, branches of willow being sometimes festooned with the pupæ. *Orgyia antiqua* must be regarded as a visitor from town, and one *Cilix spinula* has at present only one record all to itself, hence it would seem a rarity in this locality; but, taking into consideration its size and habits, there can be no doubt but that it is a regular inhabitant. The remarks on *Smerinthus populi* apply equally well to *Dicranura vinula* and also to *Pygæra bucephala*, which, however, is perhaps more commonly met with in the larval state than either of the other two.

We now come to the Geometræ, of which the list is very meagre. *Rumia cratægata* flies near, and the larvæ may be beaten from whitethorn hedges. *Crocallis elinguaria* more rarely in the same situations, the larvæ in May, the imagines in July and August. *Hemerophila abruptaria* occurs on the fringes of the marsh, evidently feeding on the privet and lilac in the neighbouring gardens. *Biston hirtaria* and *Boarmia rhomboidaria* are both fairly common at their respective times of appearance. *Acidalia scutulata* may be readily obtained at dusk flying over the mixed herbage, being almost the only representative of its genus, the exception being *A. incanaria*, which, however, is rarely seen.

Abraxas grossulariata fortunately is not common, and out of the *Eupitheciæ* three species only have been discovered at present, these being *E. vulgata*, *E. subnotata*, and *E. centaureata*, the latter being common on flowers at night, the two former being rather scarce. *Melanippe fluctuata* is abundant and well distributed; *Coremia unidentaria* and *Camptogramma bilineata* being more localised, both, however, being fairly plentiful. *Pelurga comitata* concludes the list, but is rarely seen, though its food-plant, *Chenopodium*, is very abundant.

Of Noctuæ we have a more plentiful supply, a large number being grass-feeders. *Acronycta psi* and *A. megacephala* are both numerous, as are also *Leucania pallens* and *L. impura*, the larvæ of which may be obtained, in the early spring, on grasses at night. *Hydrœcia micacea* is decidedly scarce, only three having been observed. *Axylia putris*, *Xylophasia polyodon*, and *X. lithoxylea* are all common, the latter frequently being a perfect pest at sugar. *Dipterygia pinastri*, once fairly common, is now rare without any apparent reason. *Mamestra brassicæ* and *M. persicariæ* both appear in abundance. Of the seven species of *Apamea* no less than five occur, namely, *A. basilinea*, *A. gemina*, *A. unanimis*, *A. ophiogramma*, and *A. oculea*, *A. ophiogramma* being the rarest; but it may be confidently reckoned upon at its right time, coming to both sugar and thistle flower-heads. *A. oculea* is very numerous, all varieties being common.

Miana strigilis occurs abundantly; *M. fasciuncula* rarely. *Caradrina Morpheus* is generally a pest, being in great numbers; its congeners, *C. alsines* and *C. cubicularis*, however, being much more rarely seen. *Agrotis segetum* is scarce, but its absence is made up for by the abundance of *A. exclamationis*. *A. nigricans* is also fairly common. *Triphæna pronuba*, as usual, is a nuisance. *Noctua plecta*, *N. c-nigrum*, *N. rubi*, and *N. xanthographa* are common, the larvæ of the latter being very plentiful, in early spring, upon grass banks. The larvæ of *Tæniocampa gothica* are also very numerous on dock in June, and those of *Orthosia upsilon* a little earlier, ascending the willow-trunks at dusk; this moth comes readily to sugar in the early part of July.

Phlogophora meticulosa is a rarity; not unknown, however. *Hadena chenopodii*, as usual, is most abundant in the larval state upon knot-grass, goose-foot, &c.; *H. oleracea* being equally abundant in all stages. *Plusia gamma*, *Mania typica*, *M. maura*, and *Catocala nupta* conclude the list, none of them being now in such numbers as formerly.

At some future date a list of the remaining division in this list may be forthcoming, but it must suffice for the present to say that there is good working ground for the Micro-lepidopterist.

I should here like to call attention to a curious fact which has become known to me only lately; possibly it is one already noted, but I do not remember its mention in any of the entomological works I have read. Upon several nights I found my sugar prove very unattractive, though there were evidently numbers of Lepidoptera about; upon looking for the cause I found that there was a superior attraction in the shape of the patches of thistles growing near, but I was surprised to find that it was not the flowers which were attractive. Many of the thistles were densely covered at the top with dingy green Aphides, and moths in great numbers were busily engaged in feeding upon the excrement which came from them; so intent were they upon the feast that the glare of my lantern had very little disturbing effect. The assemblage was composed chiefly of *Apamea oculea, Triphæna pronuba*, and *Leucania impura;* but many other species were sparingly represented. I am aware that ants are in the habit of feeding upon the excrement of Aphides, and have read that they even keep herds of them, if that term can be used; but the fact of Lepidoptera being attracted in the manner described was entirely new to me.

In conclusion, it may be safely inferred that several species not included in this list are in existence upon the marshes, chiefly amongst the species which are found towards the end of autumn, as the writer has not been enabled to pay such regular visits at that time as in the spring and summer. No doubt such species as *Agrotis saucia, A. suffusa, Gonoptera libatrix*, &c., would repay the searcher during September; and I trust those entomologists living near will turn their attention to the locality, which may again produce the coveted *Xylina lambda* (*Zinckenii*), which hybernates, and should be sought for also in spring.

4, Gascoyne Road, South Hackney, September, 1882.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. III.—CRYPTIDÆ (*continued*).

We have already remarked on the unsatisfactory generic divisions of the Cryptidæ, and this is especially marked in the very closely-allied and large genera *Phygadeuon* and *Cryptus*. It is often impossible to say whether certain males belong to either of these genera, the *Ichneumones pneustici*, or even *Ichneumon* itself. Thomson and Taschenberg have done much to unite the sexes and generically determine many species, but the latter remarks, "I am still convinced that many Gravenhorstian species will have to be separated from here" (Zeits. Ges. Nat., 1865, p. 58); and Ratzeburg says, "I expect that many true Ichneumons are still retained in Gravenhorst's *Phygadeuon*" (Die Ichn., iii. 141). In descriptions we constantly meet with similar remarks to "might be an *Ichneumon*, but for its exserted ovipositor" (*P. errator*, Marsh., Ent. Mo. Mag. v. 155); this shows the difficulty that would be experienced with a male specimen only: compare the remarks upon Taschenberg's *P. aberrans*, in Trans. Ent. Soc., Lond., 1881, p. 152.

The sixty-four British species included in Marshall's 1870 catalogue were increased to seventy-one in 1872, and to these we have added six, viz.:—*P. tarsatus*, Bridgm. (see Trans. Ent. Soc., Lond., 1881, p. 150), *P. probus*, Tasch. (*l. c.*, p. 152), *P. nanus*, Gr. (Entom. xiii. 53), *P. fulgens*, Tasch. (one female in Marshall's collection from Bugbrooke, Northampton), *P. speculator*, Gr. (one female in Marshall's collection from St. Albans), and *P. Marshalli*, Bridgm. (two males, labelled "*procerus*, Gr., var. 2, n. sp.," in Marshall's collection from Barnstaple); of this last species Taschenberg says, "var. 2, fehlt!". The first species described, at Entom. xiii. 53, is *P. variabilis*, Gr., *var.*, which is probably a distinct species; the second is *P. semipolitus*, Tasch. The interesting subapterous form of *P. fumator* is referred to at Trans. Ent. Soc., Lond., 1881, p. 151, pl. viii., figs. 6–8. An outline figure of a *Phygadeuon* is given in Vollenhoven's 'Schetsen' (pt. i., pl. i., fig. 18), the head and abdomen of *P.* (*Cubocephalus*) *fortipes* are well drawn in Ratzeburg's 'Ichneumonen' (vol. ii., pl. i., fig. 14), and *P. tarsatus* is badly figured in Trans. Ent. Soc.

Lond. (1881, pl, viii., figs. 9, 9 *a*). Considering the size of the genus it is remarkable how few specimens have been bred. We have been able to find the hosts of twenty-eight species recorded, but these are mostly from single scattered records; we only know of five specimens, each belonging, however, to a distinct species, that have been bred in Britain. Ratzeburg says, "It is strange that a genus which is so extraordinarily rich in species, and of which numerous individuals live in certain forest insects produces so few species, I have not a single new species to mention in this volume" ('Die Ichneumonen,' iii. 140). Many of the larger Diptera are known hosts of several species, and it is not improbable that in some instances where Lepidoptera are given that the Ichneumon was itself parasitic on a parasitic dipteron (*Tachinidæ*, &c.). Several species have been bred from sawflies, and one from a beetle larva (*Hypera rumicis*), according to Kawall, who records that he saw a pair of the same species (*P. rufulus*) *in copulâ* for fifteen seconds on July 23rd, 1852 (Stett. Ent. Zeit., xix. 67). The male is still undescribed. Ratzeburg gives the life-history of *P. pteronorum*, Hart. (*basizonus*, Gr.), as bred by hundreds from *Lophyrus pini*, pointing out how its economy resembled that of a *Tryphon* ('Die Ichneumonen,' i. 143–4); and Bouché describes the larva and cocoon of *P. curvus*, Schrank, parasitic on *Fidonia piniaria* ('Naturgeschichte der Insekten,' p. 144).

The following British species have been bred:—

3. nigrita, *Gr.*	from	Eristalis florens; (Kunckel) Giraud.
4. flavimanus, *Gr.*	,,	Emphytus serotinus; Cameron.
5. dumetorum, *Gr.*	,,	Stratiomys chameleon; Giraud.
7. rufulus, *Gmel.*	,,	Hypera rumicis; Kawall.
8. fumator, *Gr.*	,,	Mamestra brassicæ; Parfitt.
9. tenuipes, *Gr.*	,,	Fumea nitidella; Siebold.
10. troglodytes, *Gr.*	,,	Emphytus serotinus; Cameron.
12. æreus, *Gr.*	,,	Aporia cratægi, Pieris brassicæ (hyperparasitic), Eupithecia centaureata, Botys verticalis; Brischke.
26. brevis, *Gr.*	,,	Carpocapsa pomonana; (Bouché) Ratzeburg.
29. flagitator, *Gr.*	,,	Depressaria heracliana; Boie. D. depressella; Rondani.
32. profligator, *Fabr.*	,,	Depressaria nervosa; Bouché (teste Curtis' 'Farm Insects').
37. cinctorius, *Fabr.*		Geoffroy bred from *Scirpus* stem
38. parviventris, *Gr.*	,,	Lophyrus pini or similis; Brischke.
39. *quadrispinus*, *Gr.*	,,	Eristalis sp.?; Marshall.

45. curvus, *Schr.* from Fidonia piniaria; Bouché.
49. obscuripes, *Tasch.* „ Cynips Kollari gall: Billups.
56. basizonus, *Gr.* „ Lophyrus pini; Ratz., (Reissig) Ratz., Taschenberg. L. pini or similis; Brischke. L. rufus; (Heeger) Ratz.
67. fortipes, *Gr.* „ Strongylogaster cingulatus; Ratz.
69. subguttatus, *Gr.* „ Lophyrus pini or similis; Brischke.

CRYPTUS, *Fabr.*

SUBDIVISION I.—Thorax black, with or without white marks, never red.

SECTION 1.—Scutellum and abdomen black, apex of latter sometimes white.

A. Metathoracic spiracles elongate and rather large (females).
a. Antennæ white-ringed: hind tarsi not white-ringed.
* Femora and tibiæ almost entirely red.
† Aculeus one-third the length of abdomen. - 3. *lugubris*, 4½ lines.
†† Aculeus nearly as long as the abdomen. - 4. *spiralis*, 3—5½ lines.
** Front tibiæ testaceous, remainder of legs dark.
‡ Areolet quadrangular. - - - - 11. *aterrimus*, 5 lines.
‡‡ Areolet pentagonal. - - - - 6. *monticola*, 8—9 lines.
b. Antennæ not white-ringed.
§ Hind tarsi more or less pale-ringed. - 8. *tarsoleucus*, 4½—7 lines.
§§ Hind tarsi not pale-ringed.
× Hind tibiæ and tarsi black-brown. - 10. *cyanator*, 6—7 lines.
× × Apex of hind tibiæ and tarsi black. - 9. *moschator*, 3—4½ lines.
B. Metathoracic spiracles small and round, or almost so (females).
a. Metathorax without longitudinal lines and without a supero-medial area; aculeus longer than the insect. 12. *subpetiolatus*, 4 lines.
b. Metathorax with faint longitudinal lines, which bound a more or less perfect supero-medial area.
* Aculeus not so long as the abdomen.
† Areolet of wings quadrate. - - 13. *parvulus*, 2½—3 lines.
†† Areolet pentagonal. - - - 19. *digitatus*, 2⅔—4 lines.
** Aculeus as long as the abdomen (‡), or as long as the insect (‡‡).
‡ Areolet converging, pentagonal; extreme apex of abdomen white. 14. *anatorius*, 3—4 lines.
‡‡ Areolet not converging, almost quadrate; apex of abdomen black. 15. *furcator*, 4—4⅔ lines.
C. Metathoracic spiracles large and oval (males).
Antennæ not white-ringed.
a. Hind tarsi ringed with white or fulvous.
* Hind tibiæ red. - - - - - 8. *tarsoleucus*, 4½—7 lines.
** Hind tibiæ black. - - - - 9. *moschator*, 3—4½ lines.
b. Hind tarsi not pale-ringed; femora and tibiæ red, apex of hinder black.
† Metathorax with a more or less complete supero-medial area. 5. *rufipes*, 3—5 lines.
†† Metathorax with only transverse lines.
‡ Thorax rather thickly clothed with black pubescence. 10. *cyanator*, 6—7 lines.
‡‡ Thorax with a little white pubescence. - 4. *spiralis*, 3—4¼ lines.

D. Metathoracic spiracles small and round, or nearly so (males).
a. Antennæ white-ringed.
* Four apical joints of hind tarsi white. 19. *digitatus*, 2⅔—4½ lines.
** Apical joints of hind tarsi not white.
† Hind legs red, apex black. - - 20. *grisescens*, 3⅔—5 lines.
†† Hind legs black. - - - - 6. *monticola*, 8—9 lines.
b. Antennæ not white-ringed.
* Metathorax with distinct lateral spines.
† Areolet almost quadrate; supero-medial area perfectly closed. Coxæ and trochanters black. - - 13. *parvulus*, 3—4 lines.
†† Areolet converging in front; supero-medial area open in front. Femora and tibiæ red, apex of hinder black; internal orbits white. 16. *bilineatus*, 2¾ lines.
** Metathorax without lateral spines; lines of areæ prominent; femora and tibiæ red, apex of hinder black.
§ Mouth and internal orbits white. - 17. *stomaticus*, 3¼—4 lines.
§§ Face entirely white.
× Areolet pentagonal or subquadrate. - 18. *leucopsis*, 3—4 lines.
× × Areolet subtriangular. - - 7. *canaliculatus*, almost 5 lines.

SECTION 2.—Scutellum pale; abdomen black.

A. Metathoracic spiracles elongate (male and female). Antennæ of female white-ringed; face of male white-marked. 1. *viduatorius*, 2½—5 lines.
B. Metathoracic spiracles circular and small (male). Greater part of femora and face black; hind tarsi white-ringed; segments 2nd and 3rd chestnut-margined, 7th partly white. 2. *bicingulatus*, 4—5½ lines.

SECTION 3.—Scutellum black; abdomen red or red and black, apex not white.

1. Aculeus not projecting. Segments 2nd to 4th and greater part of legs red. - 60. *bellus*.
2. Aculeus distinctly projecting.
A. Metathoracic spiracles large and elongate (females).
a. Antennæ black.
* Abdomen red, base black. - - 31. *obscurus*, 3½—7 lines.
** Segments 2nd and 3rd and apex of 1st red; aculeus about one-fourth of abdomen.
† Back part of metathorax slanting; front femora more or less red at the apex. - - - - 22. *titillator* var., 2⅘—5 lines.
†† Back part of metathorax perpendicular; all the femora black. 23. *obfuscator*, 5 lines.
b. Antennæ white-ringed or marked in the middle.
× Aculeus nearly as long as the body; base of abdomen and legs red, coxæ black. - - - - - - 53. *tumidus*, 4 lines.
× × Aculeus not longer than the abdomen.
* Abdomen entirely red, or base more or less black; aculeus about as long as the abdomen.
† Metathorax with two long, acute, lateral spines; greater part of legs dark. - - - - - - 28. *spinosus*, 3½—4½ lines.
†† Metathoracic spines short and stout; greater part of legs red. 30. sponsor, 4—6 lines.

** Middle of abdomen red.
‡ Aculeus less than one-half the length of the abdomen.
22. *titillator*, 2⅘—5 lines
‡‡ Aculeus nearly or quite as long as the abdomen.
§ Nervelet* not present. - - - 24. *minator*, 2⅓—3⅓ lines.

* (*Note.*)—The *nervelet* is a rudimentary nervure that sometimes springs from the nervure between the letters *l* and *q* on the right-hand wing of fig. 2 in the plate, given at the commencement of these papers.

§§ Nervelet distinct. - - - - - 29. *Dianæ*, 3⅓—5 lines.
B. Metathoracic spiracles round or nearly so, and small (females).
a. Aculeus about one-sixth of the abdomen. 37. *analis*, 2½—4⅓ lines.
b. Aculeus about one-third of the abdomen. 35. *hostilis*, 3—3¾ lines.
c. Aculeus rather less than the abdomen. 39. *alternator*, 2⅓—3½ lines.
C. Metathoracic spiracles elongate and large (males).
a. Abdomen red, 1st segment more or less black; hind tarsi white-ringed.
* Antennæ black. - - - - - 31. *obscurus*, 5—7⅓ lines.
** Antennæ white-ringed. - - - 28. *spinosus*, 3½—4⅓ lines.
b. Middle of abdomen red; hind tarsi white-ringed; antennæ black.
† Face black and legs also, except the red front tibiæ.
‡ Transverse anal nervure of hind wing behind the brachial fork.*
22. *titillator*, 2⅓—5 lines.
‡‡ Transverse anal nervure almost opposite. 37. *analis*, 2½—4½ lines.

* (*Note.*)—See plate, fig. 2, right hind wing. The terms *behind*, *opposite* or *in front of* the brachial fork alludes to the position of the upper juncture (*α*) of the transverse anal nervure in comparison with the lower (*γ*): it is said to be *in front* when *α* is nearer the thorax than *γ*, *opposite* when both are in the same line, and *behind* when *α* is further from the thorax than *γ*.

†† Face white-marked.
§ Front (and middle) coxæ and trochanters white-marked.
29. *Dianæ*, 3¾—4¾ lines.
§§ Front coxæ and trochanters black. - 24. *minator*, 3⅓ lines.
D. Metathoracic spiracles round, or nearly so, and small (males).
Middle of abdomen, ring of antennæ, tibiæ and hind tarsi, white.
39. *alternator*, 2⅓—3⅓ lines.

SECTION 4.—Scutellum pale; abdomen red or red and black, apex not white.

A. Metathoracic spiracles elongate and large (females).
Abdomen red, petiole more or less black; antennæ white-ringed.
a. Aculeus one-third the length of the abdomen.
26. *tuberculatus*, 4 lines.
b. Aculeus about as long as the abdomen.
* Hind femora red. - - - - - 21. *attentorius*, 6 lines.
** Hind femora black. - - - 27. *apparitorius*, 4—4⅕ lines.
B. Metathoracic spiracles round, or nearly so, and small (females).
Abdomen red; femora and tibiæ red; antennæ white-ringed.
a. Hind tarsi white-ringed; aculeus abont one-half of abdomen.
36. *porrectorius*, 2¾—4 lines.
b. Tarsi not white-ringed; aculeus almost as long as the abdomen.
38. rufiventris, 8 lines.

C. Metathoracic spiracles elongated and large (males).
a. Apex of abdomen red, sometimes fuscous.
* Front coxæ dark. - - - - - 21 *attentorius*, 4—6 lines.
** Front coxæ pale. - - - - 25. *albatorius*, 4½—5½ lines.
b. Middle of abdomen red; hind tarsi white-ringed.
† Areolet pentagonal. - - - 32. *arrogans*, 4⅓—5 lines.
†† Areolet almost quadrate. - - - 42. *adustus*, 4 lines.
D. Metathoracic spiracles round, or nearly so, and small (males).
a. Abdomen red from the 2nd segment; hind tarsi white-ringed.
* Hind legs black. - - - - 40. *leucotarsus*, 3—4 lines.
** Hind femora red, base black. - - 34. *leucostictus*, 3½ lines.
b. Middle of abdomen red.
* Hind tarsi not white-ringed.
† Hind tibiæ red, apex black. - - - 35. *hostilis*, 3—3¾ lines.
†† Hind tibiæ black, base whitish. - - 41. *tibiator*, 3⅔ lines.
††† Hind legs entirely black. - - - - 45. *nigripes*, 4 lines.
** Hind tarsi and antennæ white-ringed; margins of intermediate segments white. - - - 36. *porrectorius*, 3½—4½ lines.

Section 5.—Scutellum black; abdomen red and black, apex white.

A. Metathoracic spiracles large and elongate (male and female).
Abdomen red, apex black; legs black, front ones paler; antennæ of female white-ringed. - - 44. *nubeculatus*, 3½—5 lines.
B. Metathoracic spiracles round, or nearly so, and small (females).
a. Hind tarsi white-ringed.
* Antennæ not white-ringed. - - - - *antennatus*, 3½ lines.
** Antennæ white-ringed.
† Apical joint of hind tarsi as long as the 2nd, 3rd and 4th joints. 57. *elegans*, 5—6 lines.
†† Apical joint of hind tarsi not quite so long as the 3rd and 4th joints. *amœnus*, about 4 lines.
b. Hind tarsi not white-ringed.
* Coxæ and trochanters black (var. of *migrator* and *cimbicis*, red).
† Hind tibiæ white at the base.
‡ Antennæ bicoloured.
§ Post-petiole subtransverse. - - 51. *migrator*, 3—4½ lines.
§§ Post-petiole elongate. - - - - *cimbicis*, 3—3½ lines.
‡‡ Antennæ tricolonred. - - - 54. *fumipennis*, 3—4 lines.
†† Hind tibiæ not white at the base; hind femora short and thick. 47. *peregrinator*, 2—4 lines.
** Coxæ red, middle and hind ones partly black at the base.
Head partly fulvous; ? spiracles circular. - 52. *ruficeps*, 4½ lines.
*** Coxæ and trochanters red.
× Hind tibiæ white at the base. - - 56. *incubitor*, 2⅕—3 lines.
× × Hind tibiæ not white at the base. - 57. *carnifex*, 5—6 lines.
C. Metathoracic spiracles small and round, or nearly so (males).
a. Antennæ white-ringed. - - - - *amœnus*, 4½ lines.
b. Antennæ not white-ringed.
* Base of hind tibiæ white.
† Hind tarsi white-ringed.
‡ Orbits and bifid mark below antennæ white. - *cimbicis*, 3½ lines.
‡‡ *Orbits* only white.

↔ The 5th segment the widest. - - 51. *migrator*, 3—4½ lines.
↔↔ The 2nd segment the widest. - - 54. *fumipennis*, 3—4 lines.
†† Hind tarsi not white-ringed. - - 56. *incubitor*, 2⅕—3 lines.
** Base of hind tibiæ not white.
§ Coxæ and trochanters red, hind tarsi white-ringed.
× Apical joint of hind tarsi about three times as long as wide.
57. *carnifex*, var., 4¼—6 lines.
× × Apical joint of hind tarsi about four times as long as wide.
57. *elegans*, 6 lines.
§§ Coxæ and trochanters black.
o Middle and hind tarsi white-ringed. - 47. *peregrinator*, 2—4 lines.
oo Hind tarsi only white-ringed. - - - 48. *ornatus*, 5 lines.

SECTION 6.—Scutellum pale; abdomen red and black, apex white.

A. Metathoracic spiracles elongate and large (females).
a. Antennæ and hind tarsi white-ringed. - 43. *confector*, 4 lines.
b. Antennæ white-ringed, but not the hind tarsi; aculeus about one-half of abdomen.
* Hind femora red, apex black. - - - 42. *adustus*, 4 lines.
** Hind femora entirely black. - - - 45. *nigripes*, 4 lines.
B. Metathoracic spiracles small and round, or nearly so (females).
Antennæ white-ringed; aculeus about one-half of abdomen.
a. Coxæ red. - - - - - 48. *tricolor*, 2½—3 lines.
b. Coxæ black. - - - - - - 49. *fugitivus*, 2⅓—3¼ lines.
C. Spiracles of metathorax large and elongate (males).
Femora and tibiæ red, apex of hinder black; internal orbits and ring of antennæ white. - - - 46. *tinctorius*, 3—4 lines.
D. Spiracles of metathorax small and circular (males).
a. Hind tibiæ white at the base.
* Hind tarsi white-ringed.
51. *migrator* var., *fumipennis* and *cimbicis* var. See section 5.
** Hind tarsi not white-ringed.
† Apex of 1st segment white. - - 55. *pygoleucus*, 2⅕—3 lines.
†† Apex of 1st segment not white. - 56. *incubitor*? 2⅕—3 lines.
b. Hind tibiæ not white at the base.
* Hind tarsi white-ringed.
† Middle tarsi white-ringed. - 47. *peregrinator* var., 2—4 lines.
†† Middle tarsi not white-ringed. - - - 49. *fugitivus*, 3 lines.
** Hind tarsi not white-ringed.
‡ 3rd segment red, with a black band. - 50. *subcinctus*, 3½ lines.
‡‡ 1st to 4th segments red. - - - 48. *tricolor*, 2½—4 lines.

SUBDIVISION II.—Thorax more or less red.

A. Abdomen black, anus white; antennæ black; scutellum yellow (male and female). - - - - - 59. *signatorius*, 2½ lines.
B. Abdomen yellowish red, petiole and from the 4th segment black; antennæ tricoloured (female). - 33. *minutorius*, 2½—3 lines.
C. Abdomen tricoloured.
a. Scutellum or post-scutellum more or less red (male and female).
57. *carnifex*, 4½—6 lines.
b. Scutellum white (female). - - - 58. *rufoniger*, 2½ lines.

PLATYMETOPIUS UNDATUS, DE GEER.

GENUS AND SPECIES OF HEMIPTERA-HOMOPTERA NEW TO THE BRITISH FAUNA.

By G. C. BIGNELL.

DURING the past summer I have had the pleasure of collecting in this neighbourhood with Mr. John Scott; one of our trips was a visit to Bickleigh Vale. In going there we passed through what is now a meadow, but I am sorry to say it was planted with young fir trees about two years since; fortunately the trees are at present very small, and I trust they may long remain so; but this cannot be expected; consequently in a few years the only meadow between Plymbridge and Cann Quarry will be a thing of the past. It is a lovely spot, of about three acres in extent, and situated in the heart of woodland scenery; it was in this spot *P. undatus* was taken. On our arrival there we each began to sweep and search for our respective favourites; after working some time I captured a very pretty Homopteron. On showing it to Mr. Scott he remarked, "I do not remember having taken that before." After some time I captured a second, and at the same time thought I must have taken it off a fern (*Pteris aquilina*), having just previously made a sweep for an ichneumon. I mentioned this to him, and he, taking the hint, devoted his attention exclusively to sweeping them, and was well rewarded.

This pretty insect is 6 mm. in length, and of a beautiful chocolate-brown and orange-yellow when fresh; these colours are much lighter in older specimens. I shall not attempt to minutely describe it. Mr. Scott, who has described so many before, no doubt will describe this in his favourite magazine. I may, however, say that when at rest, and viewed from above, the upper part of the head, thorax, and space been the two brace ⏞⏟ like markings on the elytra is chocolate-brown, the outer margins yellow; the legs and under side of the entire insect is a lemon-yellow.

During our walk back to Marsh-mill Railway Station, I suggested to him our next trip should be further up the vale, where the brackens are abundant, and nature permitted to have its own way, believing we might obtain a greater number, and probably another rarity; consequently on August 9th we visited Shaughbridge; but, after working some hours in the locality, did not capture a single specimen. On the 11th we again visited the first-named locality, and were rewarded with a very fair number, mostly females, in fine condition. We may, therefore, presume that the above dates would be the best time to collect any that may be required for the cabinet.

Stonehouse, Plymouth, November 16, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTE ON CHELONIA CAJA.—While wandering about Epping Forest on the 25th of July, 1882, I picked up from a tuft of grass in a bare open spot, and put into a pill box, a female *Chelonia caja.* On reaching home (on the 29th) I found that it had laid a quantity of eggs (afterwards counted, to the number of 600) and died. The eggs were watched daily until the 26th of August, when, as if by magic, all suddenly hatched. The caterpillars were immediately fed upon lettuce leaves, and all throve and grew, changiug their skins once or twice within the following ten days or so. About that time a number of the caterpillars—about 200—began to grow much more rapidly than the rest, these latter, however, continuing perfectly healthy though increasing but little in size, being now about one-half to three-quarters of an inch in length. After about a fortnight more I separated all these sluggish growing larvæ, and subsequently, concluding that they would not now feed up to their full size before winter but would hybernate, I turned them out of doors to take their chance. The 200 thriving ones continued to feed voraciously, growing very rapidly until towards the end of September, when they began to spin up and assume the chrysalis state. Just at that time, very unfortunately, the lettuce plants, from which they had been hitherto fed, failed, and leaves from a fresh and more luxuriant batch of plants were given to them. The effect of (I suppose) the too luxuriant growth of these fresh leaves was to disease and kill the larger number. About 30, or 40, however escaped and became chrysalids, ten having become perfect insects within the last fortnight. All these imagos are almost exactly like their parent, of a rather pale type, but offering scarcely any variety in their markings; the rest will doubtless emerge very shortly; three, in fact, have appeared to-day. My object in noting the above is to record an instance of a fact new to me (though perhaps familiar to others), that out of a single batch of eggs laid by one female there should be a portion (about one-third) destined, evidently by something in their own nature and vital force (quite independent of all surrounding circumstances), to develope thus rapidly to the perfect form, while the rest, under precisely similar treatment, made the slowest possible progress, through retaining every appearance of health and vigour, evidently intending to pass the winter and feed up in the following spring or early summer, not to appear probably in the perfect state until June or July, 1883. The time from the deposition of the eggs to the appearance of the first moth was seven weeks.—O. P. CAMBRIDGE; Bloxworth, November 1, 1882.

CIDARIA RUSSATA AND C. IMMANATA.—With reference to the remarks made by me on page 253 of the 'Entomologist' for the present year, that the *Cidaria immanata* taken in the Island of Arran, could, at a little distance, be scarcely distinguished from the *Cidaria russata* of the Outer Hebrides, I have since had the advantage of critically examining a large series of the insect from Arran, with Mr. Howard Vaughan, whose special knowledge of the two species is much greater than my own; we have arrived at the conclusion that the *Cidaria* taken in Arran is specifically identical with the Hebridean local variety, and that both are undoubtedly *Cidaria russata*. *Cidaria immanata* has been taken in Arran by Mr. Howard Vaughan, so that all that is necessary is to add the name of *Cidaria russata* to the list of Macro-Lepidoptera taken in Arran. *Phasiane palumbaria* should also be added to the list of the insects captured there. It is a remarkable fact that these two species, *Eubolia* and *Cidaria*, should be so closely alike that an experienced collector, as Mr. M'Arthur undoubtedly is, should have been mistaken in the species, particularly as he had also captured in some numbers *Cidaria immanata* in Shetland. I have in my own cabinet a specimen of *Cidaria russata* from Arran, singularly like some of the varieties of the polymorphic species *Cidaria immanata;* indeed I confess I thought it was of that species.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E., November. 1882.

NOTES ON HYPSIPETES ELUTATA AND CIDARIA RUSSATA.—Mr. Jenner Weir, in his paper on 'The Macro-Lepidoptera of the *Isle of* Arran,' at Entom. xv. 253, suggests that the larvæ of the small dark form of *H. elutata* feed on heath (I suppose ling, *Calluna*, is meant, and not heath, *Erica ?*). I believe that bilberry is more likely to be the food-plant; at any rate such is the case with us. Both forms of the species occur here in profusion; larvæ from woods, hedges, &c., of sallow, willow and other trees producing generally the large, greenish, striped form; and the moorlands, and especially woods having a thick undergrowth of bilberry, producing the small and nearly black, in many specimens indeed quite black, form. There is usually plenty of ling growing with the bilberry, but I am not aware that *elutata* ever feeds on it, though being such a general feeder it may to some extent do so. But the bilberry plants are always infested with its larvæ. In similar woods too, we get, along with the ordinary type, a very dark form of *Cidaria russata*, having a black central band on a very dark reddish brown ground, and without any trace of the usual slaty-gray. I have sometimes thought these were produced either from the bilberry or ling, as I do not remember noticing this particular form where those plants did not grow.—GEO. T. PORRITT; Huddersfield, November 1, 1882.

LIFE HISTORY OF EMMELESIA TÆNIATA.—I have at last had the satisfaction of breeding this handsome and most-difficult-to-get insect from a dozen eggs which a female laid on the 20th of July last year. They hatched during the second week in August; then I had to face the food difficulty, having for years tried to rear this species and only once got one larva to feed up. I then had tried every leaf, seed, and flower that grew near where the moth occurred; but all to no purpose, until accident assisted me so far then to that which has now led to success. I had picked up some moss thinking it would be suitable for any larva to change in. I was struck by seeing this particular moss having leaves on the stem like a fern; I put it under my glass; I saw some of the tip end of the leaves yellow and slightly eaten; I then found a young larva, the one noted above; I thought—so far so good, another year I will try again; I placed the eggs all on a nice bed of the *Brium*. The larva kept slowly growing, feeding on the dead leaves. When the moss began to flower they ate very little of it. In October the larvæ—some were half-grown and others very small—laid up, and there they remained doubled up on the stems until the middle of April; at that time the moss was in fine seed. The warmth of the greenhouse made them stir, and I was delighted to see the seed-vessels well cleaned out, and thought now there was hope, when I saw three fine healthy larvæ at the top of the plants. About the middle of May they disappeared; I became anxious as to their fate, thinking a great wire-worm that I found among the roots had eaten them. However, on my return home on the 12th June there was what should have been a fine female, as bad as any captured one, but having reared it was all I cared for. I made three drawings of the larva, and now give a plain description from sketches made, but I think with looking at them so much I could remember every mark on them. The larva when full grown is short, about five-eighths of an inch long, very slightly attenuated, has a very peculiar habit when at rest; it looks like a pot-hook. The ground colour of a full-grown larva is of a yellowish brown, with five clear black spots; on the sixth segment a still smaller spot, which are all of a wedge-shape. Between these spots are diamond-shaped spots of a dark brown colour, which give it the appearance of a *Eupithecia* larva. On the sides are two very narrow pale lines; beneath these the colour is of a pale ashy hue; the head and legs are of same tint. The head and body are clothed with hairs,—or spines I may call them, they are so long for a small larva. Above the anal segment, for a full eighth of an inch, it is nicely marked with dark and light brown, which looks like fine net-work. The larva curls up at once whenever it is even looked at. I generally had a peep in the evening, for during the day they were often not to be seen, having gone beneath the moss. Under all circumstances they must be difficult to breed.—J. B. HODGKINSON; Spring Bank, Preston, October 1882.

SERROPALPUS STRIATUS.—In September 1881, I took, I believe at Newmarket, a beetle which turned out to be *Serropalpus striatus*, a continental Melandryid. I should be glad to know whether any other specimens have been met with.—E. BLUNDEEL; Moulton Lodge, Luton, Oct. 11, 1882.

[*S. striatus*, Hellenius, is included in Sharp's 'Catalogue' and Pascoe's 'List.' See Ent. Ann., 1872, pp. 76–8.—E. A. F.]

RANATRA LINEARIS, *Linn.*, NEAR HASTINGS.—The Rev. W. W. Fowler speaks of *Ranatra* as occurring near London and Deal (Entom. xv. 230). In 1879 and 1880 this insect was extremely abundant in ponds at Bopeep and Guestling, and also near the *town* reservoirs. For the last two years, however, I have searched in vain in the same places. At Reigate I took two or three specimens in a pond in the Castle Fields in April, 1879. *Naucoris cimicoides*, Linn., used to swarm in this same pond.—E. P. Collett; St. Leonard's-on-Sea, October 10, 1882.

Hoplisus bicinctus, *Rossi*.—On the 1st August last, between Bickleigh Bridge and the railway station, I had the pleasure of taking two females of this rare wasp. It differs, however, from Mr. Smith's description in having the fuscous portion of the flagellum extended to and beyond the last apical joint; in having on the scutellum a yellow line, instead of two spots; on the 1st segment of the abdomen two egg-shaped spots broadly united, and covering the upper surface and nearly the whole of the sides (in fact it would be better described as a band), instead of two triangular spots; the broad yellow band on the 2nd segment is continued across the venter; the narrower band on the 3rd is not continued across the venter, but is represented by a dot on each side and two in the centre, in one specimen; in the other the central dots are wanting. Mr. E. Saunders describes this insect with two spots on the 1st segment, and length 11 mm.; these specimens are respectively 9 and 9½ mm.—G. C. Bignell.

Entomology of Australia.—I may premise by stating that I am an amateur entomologist, living in the Bush on a cattle-station some 80 miles south-west of Rockhampton, and being desirous of extending my collection of insects, and moreover encouraged by that felicitous motto on your 'Entomologist,' I take the liberty of asking if you would kindly introduce me to some of your entomological acquaintances who perhaps would be glad to make exchanges, either for the Coleoptera or Lepidoptera of Australia. My desiderata are foreign Lepidoptera or Coleoptera, not European. I could obtain Flies, Hornets, &c., or Bugs, should they be desiderata. I trust you may meet with some who would be inclined to correspond.—Geo. Barnard; Coomooboolaroo, Duaringa, *via* Rockhampton, Queensland.

OBITUARY.

William Hey.—The Venerable Archdeacon Hey, born at Ockbrook, in Derbyshire, of which place his father was Vicar for over forty years, died at the Canon's residence within the Cathedral precincts, at York, suddenly, of heart disease, November 22nd, 1882, in his 72nd year. To those who, like the writer of this notice, knew the Rev. Canon Hey at the time when he most assiduously worked the Coleoptera of York district, the announcement of his death comes almost as a personal loss, and a reminder that one may outlive one's earliest friends. Although not an obtrusive writer upon that branch of Entomology, Coleoptera, which was his particular forte, few men knew the great division Hydrodephega so well as he. His careful examination of the aquatic life of the ponds adjoining the well-known boggy ground near Askham resulted in the addition of, we believe, more than one species to the British fauna, and many species, which were almost unknown in the collections of the time, found numerous representatives through the kindness of this amiable collector. In his earlier life, while at Cambridge, he devoted much attention to the Lepidoptera of the district, and used, years afterwards, to point out with pride specimens of *Polyommatus Hippothoe* in his collection as his own capture. Although a man whose time was very fully occupied by constantly increasing Church work—amongst other important appointments he was Archdeacon of Cleveland, Canon Residentiary and Precentor of York, Rural Dean, Vicar of St. Olives, York, and Examining Chaplain to the Archbishop of York—the venerable Archdeacon ever found opportunity to entertain even the most humble worker in his favourite study, and to afford the student such assistance as he might, with such felicity as to send away the young entomologist feeling that in addition to obtaining knowledge he had also made a friend. In the local scientific world he was associated with the Yorkshire Philosophical Society, to the council of which he was elected in 1841, and of which, at the time of his death, he was one of the honorary curators, taking the meteorological department of the Museum, and sole curator of the insects and Crustacea; being likewise a vice-president of the Society. Archdeacon Hey was one of the early members of the British Association, and will be well recollected by those who attended the Jubilee of that Society, held last year in York, for the great personal interest which he took in its business on that occasion. We may conclude by observing that this is another instance of hereditary scientific taste, his grandfather, William Hey, F.R.S., of Leeds, being one of the shining-lights of his day in philosophy and science. We understand the Rev. W. C. Hey, son of the late *Archdeacon,* inherits his father's taste as a Coleopterist.—J. T. C.

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